DP Security Only as Good As Enforcers

By Bruce Hoard
CW Staff

NEWTON, Mass. — DP security is only as good as the people who administer it, and right now it is painfully inadequate, IBM senior consultant Robert Courtney told attendees at the Computer Security Conference here last week.

Courtney deplored the waste of time and money associated with sloppy security and voiced a litany of complaints against it at the conference, which was sponsored by the American Society for Industrial Security.

DP directors, internal auditors and professional security people are primarily responsible for computer security, and it is they who are falling down on the job, Courtney told the group of 75 security professionals.

DP directors are the least culpable of the three because their jobs are primarily to oversee the processing, not protection, of data, he said.

The consultant saved his most scathing criticism for internal auditors, whom he labeled "a bunch of clowns who show up after the battle and shoot the wounded." Even though they have historically had a role in DP security, their knowledge is technically obsolete, he said.

Professional security people have also failed to keep up with the demands of modern computer security, Courtney said, adding, "You have tended to converge your attention in very narrow areas. You have to look at all the bad things that can happen if you are to provide cost-effective security."

'Intellectual Titillation'

He accused his audience of being more concerned with "intellectually titillating" security abuses such as fancy technological rip-offs than with the mundane security breaches which, he claimed, pose more serious problems. It is incompetency, not dishonesty, with which security people should concern themselves.

In order to prove that point, he cited an instance where an improperly supervised programmer at the Social Se-

(Continued on Page 8)

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Crime Watch

Surprise Plea In SSA Theft

By Jake Kirchner
CW Washington Bureau

BALTIMORE — The trial of a suspected computer criminal ended abruptly here May 27 when, to the surprise of prosecutors, the defendant pleaded guilty to all 43 counts of using Social Security Administration (SSA) computers to steal $102,000.

Janet Blair, a former employee at the SSA processing center in nearby Woodlawn, was charged earlier this year with using SSA computers to issue unauthorized benefits checks to several accomplices, who cashed them at various banks around the country [CW, March 3].

Her two codefendants had earlier pleaded guilty to the charges after

(Continued on Page 4)

Belgian Charged With Bribery

By Jake Kirchner
And Marcy Rosenberg
CW Staff

ALEXANDRIA, Va. — A Belgian DP executive has been indicted here on attempted bribery charges after allegedly offering $500,000 for a copy of the source code for Adabas, the data base management system from Software AG of North America, Inc.

Marc Andre DeGeyter was being held in New York last week on a $500,000 bond after he was arrested May 18 at Kennedy International Airport, where he allegedly handed over a half-million-dollar check in exchange for two reels of magnetic tape he thought contained the Adabas source code.

The indictment, handed down in

(Continued on Page 4)

H Series Still Not Ready?
IBM Unveils AP, Whitney Drives

By Tom Henkel
CW Staff

WHITE PLAINS, N.Y. — IBM last week made its top-of-the-line 3033 processor even bigger by announcing a six-channel attached processor (AP) and two large, superfast disk drives that can replace current IBM 3350 drives.

In a move most analysts agree is a firm indication that IBM's long-awaited H series of CPUs still isn't ready, IBM announced the 3042 Model 2, a revamped version of the 3042, adding a standard six channels which are expandable to 12. With the combination of a 3033 and a 3042 Model 2, IBM users can now get up to 28 channels — 10 of which can be used to support the newly announced fast disk drives.

Called the 3380 and 3375, the drives offer a maximum of 2.52G bytes of virtual storage with an unequaled 16-msec access time. The smaller 3375 offers 820M bytes of storage with 19-msec access time. Both drives can be attached to the CPU in place of a smaller 3350 drive via a channel enhancement called a Data Streaming Feature that slows the transfer rate to a level the channel can accept, IBM said.

MVS Enhancement

In addition, IBM further unbundled its OS/VS2 MVS operating system, introducing five program products designed to improve systems and processor storage management. The MVS enhancements also include an extended addressing feature that doubles the amount of information a 3033 can directly address. A 3033 can now directly address up to 32M characters, IBM said.

The larger disk drives mean 30 series users can get up to 2.52G bytes of virtual storage on channels used for 3350

(Continued on Page 6)

Magnuson Mid-Range CPU Joins Plug-Compatible Line

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — Magnuson Computer Systems, Inc. today expanded its IBM-compatible processor line with the introduction of a medium-scale mainframe that reportedly provides 20% more performance and costs 20% less than the IBM 4331 Group 2.

Users of Magnuson's latest system, the M80/31, will receive support for the OS/VS2 MVS, DOS and DOS/VS operating systems, none of which are currently supported by IBM, a Magnuson spokesman said. Magnuson will also support all OS/VS1 and VM/370 releases, in contrast to IBM, which supports only VS1 Release 7 and VM/370 Release 6.

Available for delivery 30 days after receipt of order, the M80/31 fits roughly in the middle of Magnuson's product line, which now consists of six IBM plug-compatible mainframes. Below the M80/31 lie the low-end M80/3 and M80/4; above it lie the top-of-the-line M80/32, 42 and 43.

As its model number suggests, the latest Magnuson system offers somewhat less computing power than the next largest member of the M80 family — the M80/32, which provides 50% greater performance than IBM's 4331 Group 2, the spokesman said.

Like all its sister systems, the M80/31

(Continued on Page 4)

Users May Be High and Dry In Wake of FCC Final Ruling

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Users of value-added communications services will be in trouble this month unless the Federal Communications Commission (FCC) delays implementing a key provision of its recent "final" decision in the Second Computer Inquiry, according to GTE Telenet Communications Corp.

The FCC decision, issued last month [CW, May 12], deregulated enhanced — i.e., computer-based — telecommunications services.

If this happens, the services will not be tariffed and therefore will have to be offered on the basis of contracts negotiated with each customer. But the negotiating process cannot be completed until long after the June 13 effective date.

Deregulating the services in the absence of contracts would create "drastic and intolerable risks for the parties involved," Telenet contended in a petition submitted to the FCC early this month.

"What liability would the carrier and the customer have with respect to service outages, malfunctions and various accidental losses and injuries during this period? How would a carrier measure the amount of charges he could recover from his present customers for

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Editor E. Drake Lundell Jr.

Managing Editor Nancy French

Senior Editors:
Industry Marcia Blumenthal
Software Marcy Rosenberg
Communications Brad Schultz
Systems Rita Shoor
Features John C. Whitmarsh

Senior Writer:
Communications Phil Hirsch

Correspondents:
West Coast Jeffry Beeler
Washington, D.C. Jake Kirchner

Writer/Analyst Marguerite Zientara

Staff Writers Tom Henkel
Bruce Hoard
Timothy J. Scannell
Connie Winkler

Chief Copy Editor Cheryl M. Gelb
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Photography Editor Ann Dooley

Editorial Assistants Denise Petski
Martha Taylor

Editorial Cartoonist Jim Orton

Contributors:
Education J. Daniel Couger
Taylor Reports Alan Taylor
Human Connection Jack Stone

For Sales, Circulation and Production contacts, see inside back page.

Please address all correspondence to the appropriate department at 375 Cochituate Road, Rte. 30, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153

OTHER EDITORIAL OFFICES:

West Coast: 407 California Avenue, Suite 10, Palo Alto, California 94306. Phone: (415) 328-8064.

Washington, D.C.: 821 National Press Building, 529 14th Street N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Steve Burton, IDG Publishing Ltd., 140-146 Camden Street, London NW1 9PF Phone: 01-267 1201. Telex: 851 264737.

W. Germany: Eckhard Utpadel, CW Publikationens, Friedrichstrasse 31, 8000 Munich 40, Phone: (089) 34-90-61. Telex: 5215350.

Asia: Hidetsuna Sasaki, Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: J2424461.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: SECCO AA25468.

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

Mexico: Kevin Kelleghan, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F., Phone: (905) 514-4218, (905) 514-6309.

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'Deliberately Deceived Me'

Whittaker Charges FAA Coverups

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Rep. Bob Whittaker (R-Kan.) has charged the Federal Aviation Administration (FAA) with falsifying documents and covering up air travel safety deficiencies, including the actual number of air traffic control computer outages.

Speaking before the convention of the Professional Airways Systems Specialists (Pass) union in Chicago recently, Whittaker presented the results of his seven-month study into alleged FAA problems.

Claiming that the FAA has "deliberately deceived me, and the entire United States Congress, concerning the severity of air safety problems," Whittaker called for U.S. Attorney General Benjamin Civiletti to study the alleged coverups.

In addition, Whittaker asked that the Inspector General of the Department of Transportation, Frank Sato, begin a probe into the matter of FAA policies and procedures regarding air safety "for possible government action or prosecution."

According to FAA computer-generated printouts acquired from "a source in the field," a Whittaker aide said, the actual number of computer outages at ATC centers is as much as four times what the FAA has admitted in congressional testimony and in response to Whittaker's own inquiries.

"For the first week of 1980," Whittaker reported, "[FAA Administrator Langhorne] Bond said that the Air Traffic Control System was out of commission only 115 minutes nationwide, while the official computer printout shows the system out for 486.5 minutes.

"Mr. Bond listed 73 start-overs. The computer printout listed 270," Whittaker continued. "For the week of April 18 of last year, Mr. Bond listed 131 start-overs. The computer printout listed 263. Mr. Bond listed 132 minutes lost. The computer printout showed 241.

"It is clear that either the administrator of the FAA does not know the performance levels of the equipment which is responsible for thousands of lives each day, or he is simply not willing to tell the truth," Whittaker asserted.

'Show Us the Data'

The FAA, however, claims Whittaker "has magnified the problem" and has failed to produce data backing up his allegations. "We've asked [Whittaker] to give us the data to back this up, but as of Monday we hadn't heard anything from him," FAA spokesman John Leyden said last week.

"We did send [Whittaker] a letter saying we'd rechecked [our figures] after the speech and we'd found only one error that increased the total number of minutes the computer was down at the Boston center the week of Jan. 8 from 110 minutes to 204," Leyden said.

"But [Whittaker] was claiming it was 460 or so that week, so we can't come to terms with his numbers," he said. "Our basic answer is 'show us the data and show us where you say we're covering up,' " he added.

Referring to Whittaker's charge that "for each and every day of the week, 24 hours a day, there is a computer failure on the average of once every 63 minutes," Leyden stated, "One of the things he's doing is lumping together 'unscheduled start-overs' [self-correcting actions by the computer that flush erroneous raw data out of the system] and actual outages."

Most unscheduled start-overs, according to Leyden, "last less than 10 seconds, which is less time than the radar takes to sweep once around, so the controller isn't really even aware of it in most cases."

Acknowledging that the two types of outages were lumped together in Whittaker's statistics, and that the 45-second outages are "not as severe" a safety hazard as system outages, Whittaker's press secretary Steve Lotterer still maintained the shorter outages are "not insignificant."

Besides the fact that controllers have no way of knowing whether the computer will be down for 30 seconds or conceivably hours, Lotterer noted, "In 45 seconds, two planes coming at one another at 500 to 600 miles an hour can cover an awful lot of ground."

As for the FAA's claim that Whittaker's data doesn't jibe with its own, Lotterer responded, "We don't feel the data and the analysis [the FAA] has given us and has released publicly is accurate according to the information we've collected.

"We're not sure exactly where [the FAA's] data came from," he added, explaining, "Our data came from actual computer printouts; their data and the data they released to us was in the form of a hand-drawn grid with numbers of start-overs, outages and minutes lost penciled in."

While Whittaker's staff had requested "the official weekly computer-generated report" from FAA Chief Bond, "we got the penciled-in stuff instead," Lotterer said. As for how Whittaker's office obtained the computer printout, "I can't really say," Lotterer added.

Lotterer noted that the Attorney General and Department of Transportation's Inspector General "have acknowledged receipt" of Whittaker's formal requests for investigations.

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Robin Hood

High Sheriff of Armonk accuses SyncSort OS of "taking from rich, giving to poor!"

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NEWS REPORT

In a crowded press conference, the High Sheriff of Armonk today charged that a sort program is "taking resources from rich computer systems and giving them to poor OS/VS users throughout the Realm."

Speaking to reporters at his heavily fortified castle, the Sheriff, Sir Basil Bathrobe, said: "Frankly we think it's time somebody blew the whistle on this Robin SyncSort fellow and his so-called Merry Band.

"These varlets cause trouble every time we send an expensive system through Whitlow Forest. First they capture it, then they use software black magic to extract more sorting work for fewer resources.

"And the worst part is that they pass these savings along freely to thousands of SyncSort users. As a result 62% of the nation's OS/VS users are saving anywhere from 15% to 50% on the amount of CPU Time, Elapsed and SIOs they use. They're simply evading their sorting taxes," the Sheriff said.

"King John has authorized me to say that he views this situation with great alarm. He hasn't been so upset by anything since Magna Carta!"

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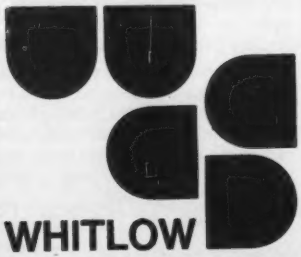

WHITLOW COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

Honeywell Adds Mainframe For Xerox Users, Extends CP-6

By Rita Shoor
CW Staff

WALTHAM, Mass. — Honeywell, Inc. has provided performance capabilities comparable to its top-of-the-line DPS 8/70 system to users from the Xerox Corp. customer base with the introduction of the DPS 8/70C mainframe last week.

In conjunction with announcing the large-scale CPU, which Honeywell claimed is more powerful and energy-efficient than the company's Level 66/DPS/B and C models, the mainframer introduced several extensions to its CP-6 operating system. The CP-6 operating system was developed to provide a growth path for Sigma series users from the Xerox base who were running with CP-V software.

The 1M-byte DPS 8/70C can provide 60% to 80% more performance, depending on the applications being run, than a fully configured Level 66/DPS/C3 system supporting 120 users, a company spokesman claimed. Cache memory has been increased from 2K bytes to 8K bytes.

Peripheral storage is provided by 1.1G-byte disk units with two spindles and two access heads. The data transfer rate is 1.2 M byte/sec, with a reported average access time including latency of 33 msec, according to Honeywell.

Large-scale integrated (LSI) technology was applied in the system's execution and control areas as well as in the cache, directory and control store functions. The use of LSI and multilayer boards with high chip densities led to a reduction in the number of boards required for the processor, a spokesman said.

CP-6 Operating System

Extensions to the CP-6 operating system include a transaction processing access mode and a terminal-oriented forms processor. The system will now support such additional peripherals as a remote communications processor, the 1.1G-byte nonremovable disk units, 6,250 bit/in. tape units and a 500 card/min card reader, Honeywell stated.

The CP-6 transaction processing extension does not run as a subexecutive, a spokesman said, but interacts directly with common operating system services including execution scheduling, recovery, accounting, journaling, file and data management and terminal and I/O device handling.

A typical 120-user DPS 8/70 system, including CPU with 1M byte of main storage, system console, communications processor, 3.3G bytes of disk storage, four tape units, one card reader and two line printers, can be purchased for approximately $2,250,000. Monthly rental for the same configuration on a five-year lease is $65,900.

Initial shipments of the DPS 8/70C will begin in the third quarter of 1981, Honeywell said from 200 Smith St., Waltham, Mass. 02154.

Magnuson Mid-Range CPU Joins Plug-Compatible Line

(Continued from Page 1)

conforms to Magnuson's "strategic architecture," which allows the mainframe to be modularly upgraded in the field. By simply adding or replacing processor, memory and I/O boards, users in effect can convert the product into any of the M80 family's three larger systems.

In addition to the central processor, the M80/31 incorporates a console display, keyboard, optional console printer and dual floppy diskette units for loading microprograms into control storage.

Users can arrange the modules into either one of two configurations. In the standard configuration, the console display is integrated with the rest of the system. In the "stacked" version, the display unit can be detached from the other system modules and placed as far as 15 feet away.

A minimum M80/31 system incorporates a 100-nsec CPU with 1M byte of main memory, one byte I/O channel and two block I/O channels. On the average, the processor executes .35 million to .45 million instructions/sec.

The system's main memory, which has a 600-nsec cycle, expands in 1M-byte increments to a maximum of 8M bytes. The processor also comes with a 16K-byte cache memory and 48K bytes of control storage expandable to 256K bytes.

To the M80/31's lone byte I/O channel and two block I/O channels, users can add up to three additional channels for a total of six. In byte mode, the processor's channel operates at 36K to 500K byte/sec; in burst mode, at 2.5M byte/sec. The system's aggregate data rate reportedly totals 13.3M byte/sec.

A typical M80/31 configuration with a 1M-byte CPU, console display, one byte channel and two block channels costs $135,000. The system is available from Magnuson at 2902 Orchard Park Way, San Jose, Calif. 95134.

Belgian Held in Software AG Bribery Case

(Continued from Page 1)

the U.S. District Court here last Monday, charges DeGeyter with eight counts of attempting commercial bribery. Each count carries a maximum penalty of five years in jail and a $10,000 fine.

The Federal Bureau of Investigation office here identified DeGeyter as president of Seca, a Brussels DP systems engineering company. According to the indictment, he approached Software AG saying he represented Techmashimport, a Soviet foreign trading company, and offered $150,000 for the Adabas source code.

Adabas is a data base management system developed for large-scale IBM and compatible systems.

The firm's president, John Maguire, reached at an Adabas users conference in Houston last week, said the company contacted the FBI after "a senior technical person" was approached by DeGeyter more than a year ago.

The Belgian reportedly raised his offer to $500,000 after being told that the source code could not be bought, but would have to be stolen. According to Maguire, his employee met DeGeyter at Kennedy International under FBI surveillance and handed over the two tapes in exchange for the $500,000, at which point DeGeyter was arrested.

The 31-year-old Belgian citizen was scheduled to be moved from New York to face arraignment here late last week, according to Theodore Greenberg, assistant U.S. attorney.

Greenberg declined to discuss the case further, and the FBI would verify the facts only as outlined in the indictment.

The indictment does not say to what extent, if any, Techmashimport is involved in the alleged bribery attempt. The trading company's representative in New York could not be reached for comment.

SSA Theft Leads To Guilty Plea

(Continued from Page 1)

bargaining with the government, but Secret Service investigators said they were "totally surprised" at Blair's guilty plea at the outset of her trial in the U.S. District Court here.

Blair has not been sentenced yet, but faces penalties of up to 15 years in jail and $10,000 in fines on the 43 counts of forgery, conspiracy and issuing false U.S. Treasury checks.

'Fearful of Talking'

Sources close to the investigation suggested Blair "must be awfully fearful of talking" to accept "scores of years in jail" rather than go through with a trial that might reveal information implicating other, unindicted accomplices.

One unanswered question, for instance, is who helped Blair erase the automated records of the illegal transactions. Blair did not have access to the Woodlawn computers, according to SSA officials.

The Secret Service said it is "wrapping up the loose ends of the case," and the SSA has not been able to find any further evidence of fraud [CW, April 20], but no accomplice within the SSA DP center has been identified.

And investigators said they have not been able to determine exactly how the fraud was committed, admitting it was detected only by accident: a Philadelphia bank official became suspicious when some of the fraudulent checks passed through his bank.

The Secret Service indicated further indictments in the case are still possible. One hope is that Blair eventually will cooperate in the investigation.

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QWIKTERM

Norad False Alert Pinpointed to System Error

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — For the second time in seven months, U.S. strategic forces were put on alert June 3 when a malfunctioning computer indicated a Soviet missile attack against the U.S.

The offending DP system of the North American Air Defense Command (Norad) in Colorado Springs, Colo., was closely monitored until a similar malfunction three days later helped technicians isolate the problem, according to the Pentagon.

The malfunction caused the Strategic Air Command (SAC) to begin readying some of its aircraft, the Defense Department said, but the alert was called off within three minutes when other sensing devices failed to corroborate an enemy attack.

A Norad spokeswoman in Colorado Springs said the command's DP personnel "don't know at this point whether it was the computer [hardware] or software" that caused the problem.

The suspect portion of the Norad system has been replaced with backup equipment and is being tested to finally isolate the problem, the spokeswoman said last week.

The 427M system, developed for Norad by Honeywell, Inc., was installed recently to replace aging Norad equipment and had been "declared operational," but "there was still some testing that was going on at the time [of the malfunction]," she said.

More information on the exact nature of the problem and on what type of equipment was involved should be available "within a few days," when the investigation is expected to be completed, according to Norad.

DP Malfunction

This latest incident differs from the false alert last November in that the earlier problem was "basically a human error" — a test tape was inadvertently fed into the system, according to Pentagon spokesman Lt. Col. Michael Burch.

At the time, however, Norad officials blamed the Honeywell DP system, then termed "experimental," for the error [CW, Nov. 19].

A statement released by the Pentagon June 7, following the "controlled" third warning said "the computer readout indicated an ICBM [intercontinental ballistic missile] and SLBM [submarine launched ballistic missile] attack." But, the statement said, "none of the indicators of actual missile attack registered any sign that missiles were headed toward the United States.

"Within three minutes it was positively determined there was a computer malfunction," the Pentagon continued. "The engines of some planes of SAC were turned on since SAC automatically responds to any warning signals, but no planes of any kind were moved and none was sent into the air.

While not downplaying the seriousness of the false alerts, Defense officials noted that a full-scale U.S. reaction — such as launching bombers and missiles — would have required Presidential action following verfications of an attack from several complementary warning systems, none of which corroborated the alert signals from the faulty computer system.

Reaction to the false alerts from U.S. allies and adversaries was not as measured. According to several press reports, the computer malfunction caused considerable alarm in the British House of Commons, where one member called the incident "spine-chilling" and demanded an emergency debate.

And, as it did following last November's incident, the official Soviet news agency Tass reacted sharply to the June 3 alert, saying that "during several minutes the world was on the brink of nuclear war."

Such "electronic faults of the Pentagon have no justification," Tass said.

National Semi Shuns Volcano

SANTA CLARA, Calif. — Fearing another volcanic eruption from Mount St. Helens, National Semiconductor Corp. has deferred its plan to build a previously announced 200,000-square-foot manufacturing facility in Vancouver, Wash.

National Semi said it will select another location for the wafer fabrication facility, which was scheduled to open in Vancouver late next year.

Charles E. Sporck, president of National Semi, said, "This action in no way changes our original belief in the future desirability of Vancouver. We look forward to being able to build a subsequent facility, once the situation is stabilized."

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System/38 Cobol Compiler Seen Lure for System/3 User

By Tom Henkel
CW Staff

ATLANTA — IBM has announced a Cobol compiler for its System/38.

Said to meet American National Standards Institute (Ansi) 1974 Level 2 specifications, the compiler is viewed by industry watchers as an attempt to make System/38 more attractive to current IBM System/3 users.

Scheduled for May 1981 release, the compiler was to have been released with first end-user shipments of the mainframe, one IBM watcher speculated, adding that problems with the System/38 operating system forced IBM to delay the announcement until it was sure most of the bugs had been ironed out of the system. The first end-user shipment of System/38 is scheduled for July following a six- to nine-month delay.

The addition of the Cobol compiler means System/3 users with applications programs written in Cobol can now transfer those programs directly to a System/38 following some minor changes to accommodate the System/38 data base management system. In addition, the release suggests that vendors offering Cobol-based software for the System/3 can adapt those programs for the System/38 market, the IBM watcher noted.

Licensed Product

System/38 Cobol is a licensed program product that operates under the system's Control Program Facility. It consists of a compiler with syntax checking in either a batch or interactive mode using System/38's Source Entry Utility, IBM said.

The compiler will translate data definition specifications from System/38 into Cobol source statements for the data base or terminals, IBM said.

Other features include sort/merge support for up to eight input files, a multiple sort capability in a single program, support for nested IF statements and a dynamic CALL and CANCEL function, according to IBM.

In addition, the System/38 Cobol compiler will utilize the previously announced Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) communications support, IBM noted.

The compiler will cost $140 a month.

CSC Extends Infonet With Distributed Service

EL SEGUNDO, Calif. — Computer Sciences Corp. (CSC) has extended its Infonet time-sharing service by adding a distributed network service geared to let customers process information on local processors as well as remote host systems.

The extended service combines CSC-provided minicomputers and software at customer locations with Infonet's international communications network and large central computers. Besides hardware and software, the company will supply network communications, technical support and a quantity of Infonet system resources, a spokesman said. The service will cost a minimum of $4,000 on a two year commitment.

The Distributed Network Service will utilize Digital Equipment Corp. PDP-11/23 and PDP-11/44 processors configured to CSC's specifications and additional software developed by CSC. The local systems, or Infostations, will have from 128K to 512K bytes of memory; from 1M to 286M bytes of disk storage; printers offering speeds of from 180 char./sec to 600 line/min; from one to 16 CRT terminals; and a 4,800 bit/sec communications capability, the spokesman continued.

Infostation software will be structured to be used both by experienced programmers and by users with little DP knowledge, he added.

A subset of CSC's proprietary data base management system, called Manage, will also operate on the Infostation. The Distributed Network Service is aimed at large industrial, commercial and governmental organizations with multiple offices, warehouses and plants. CSC is located at 650 N. Sepulveda Blvd., El Segundo, Calif. 90245.

IBM Revamps 3042 AP, Adds Large Drives

(Continued from Page 1)

drives which have a 317M-byte capacity. In addition, the 3042 announcement means attached processor users not only can substitute the much larger 3380 drives for existing 3350s, but they also have the capacity to attach even more large drives on the extra channels.

While the larger drives and the new attached processor may be a boon to 30 series users with squeezed storage capacity, those users will pay a premium for the added space. Most analysts agree IBM has priced both drives and the 3042 Model 2 as high as it possibly could in an effort to bring in some additional revenue. The 3380 costs between $97,650 and $142,000, and the 3375 is priced between $31,000 and $46,450.

The 3042 Model 2 is priced favorably for purchase, as opposed to lease or rental, at $1,225,000.

IBM also cut the purchase price of the older 3042 AP about 10% from $895,000 to $805,000; lease and rental prices for the 3042 are unchanged.

Bytes Per Dollar

While IBM has traditionally doubled the bytes-per-dollar ratio in successive disk releases, the 3380 offers 56,800 bytes per dollar, slightly more than twice the number of the 3370, with 24,000 bytes per dollar. The 3375 offers a similar ratio at 56,646 per dollar.

While capacity-strangled 3033 AP users may be elated over the 3042 Model 2 announcement, most industry watchers were more interested in the new disk drives. Said to be IBM's Coronado or "project Whitney" disks, the drives offer unequaled speed and capacity, analysts say.

The larger 3380 is a two-spindle machine with two actuators per spindle. Each spindle can store 1.25G bytes of data with a 3M byte/sec transfer rate. The disk access time is 16M seconds, according to IBM.

The 3380 can be used on any 30 series CPU, the 370/158 or the 370/168. A data streaming feature for the 370 models is expected.

The smaller 3375 offers a single spindle with two actuators on the spindle. It can store a maximum of 820M bytes of data with a 1.86M byte/sec transfer rate and a 19-msec access time. That drive can be used on the 30 series and IBM's 4341 and 4331 Model Group 2. The 3375 does not support the 4300's Fixed Block Architecture (FBA), however, a feature that led some analysts to believe the drives are intended more for an OS environment than for DOS.

First shipments of the 3380s are slated for the first quarter of 1981, while the 3375 won't be shipped until the third quarter of 1981, IBM said.

The 3042 Model 2 will be available in the third quarter of 1980, the firm said.

In addition to the major disk drive and attached processor announcements, IBM made further steps toward unbundling its OS/VS2-MVS operating system. The firm announced MVS has at least five program products.

The five products are: Data Facility/-Device Support (an OS/VS2-MVS version costs $75/mo and an OS/VS1 version costs $57/mo), Data Facility/-Data Set Services ($75/mo), Data Facility/Extended Functions ($140/-mo), Release 3 of the Hierarchical Storage Manager ($385/mo) and a conversion aid for the new disk drives called Direct Access Storage Device Migration Aid, which costs $1,000 for a one-time license, IBM said.

The five program products, collectively billed as the Total Storage Management approach, ease storage maintenance and efficiency, IBM said. Analysts take that statement to mean the operating system was altered to support the new disk drives.

The crux of the MVS announcement is that a once fully bundled operating system is becoming more and more unbundled — a trend IBM seems to be using to generate increased income from its software products.

Also announced for the 30 series was a 3814 switching management system which allows users to electronically vary the interconnections between processors and peripheral equipment.

The purchase price for the six-channel version of the 3042 Model 2 is $1,225,000. The monthly lease charge is $53,430 on a four-year agreement. The unit rents for $58,773/mo.

The 3380 comes in two models; the Model A can attach up to three Model B drives. The drives cost between $97,650 and $142,200. The units lease for $2,170/mo and $3,160/mo on a two-year lease and rent for $2,550 to $3,713, IBM said.

Model A disk drives have the logic required to manage Model B drives in a string, IBM said.

The 3375 costs $46,450 for the Model A1 and $31,000 for the B1. A two-year lease costs $1,080/mo and $720/mo and the units rent for $1,269/mo and $846/mo respectively.

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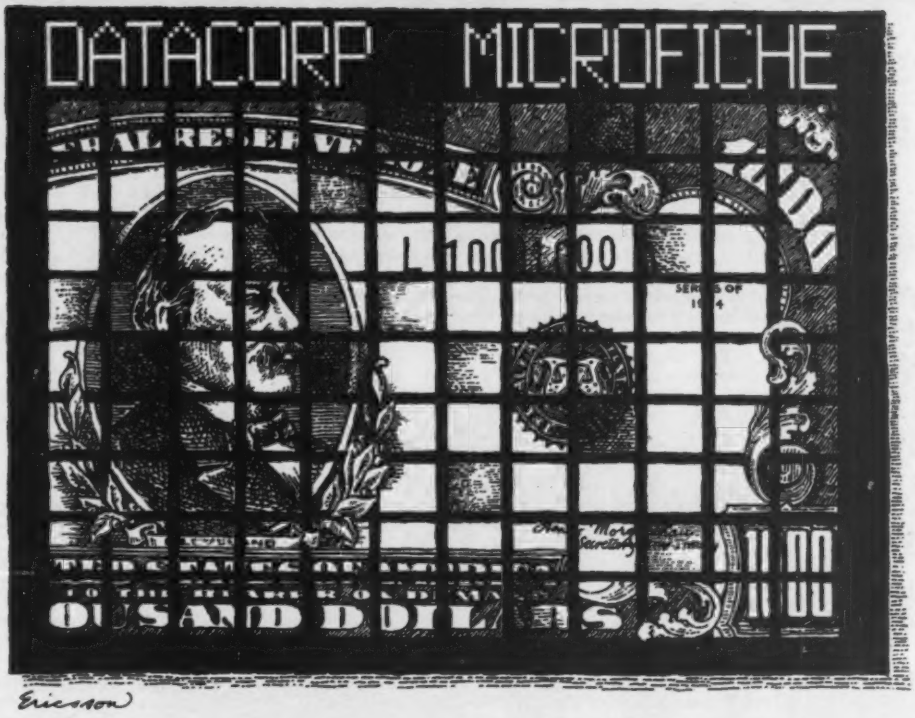

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FCC Ruling May Leave Users High and Dry

(Continued from Page 1)

service furnished after deregulation and prior to execution of a contract?" Telenet asked.

Preferential Treatment

An ex-carrier's larger customers might seek special concessions, Telenet added, which would force the supplier to compensate for the resulting revenue losses by withdrawing services from "less economical sectors" of its market or by increasing its charges to smaller customers.

Another danger is that some customers might seek special advantages at the expense of others. "It will be natural," Telenet said, "for their larger customers to seek concessions from the ex-carriers," conduct "which would be unlawful under Title II" of the 1934 Communications Act.

To compensate for revenue lost by granting such concessions, the company said, the ex-carriers probably would "withdraw services from less economical sectors of their market or increase their charges to smaller customers."

To eliminate these problems, Telenet asked the FCC to defer deregulation of enhanced services for at least six months after the commission had disposed of petitions for reconsideration.

"Questionable" Provisions

The need for reconsideration, the company added, is based on several "questionable" provisions in the May decision:

- The FCC lacks the authority to "forebear" from regulation of "activities constituting interstate communications common carriage." Aside from deregulating enhanced services, the decision also allows AT&T and other carriers to market all their terminals without first filing tariffs and having them be accepted by the commission.
- "In asserting . . . jurisdiction over data processing, the commission has unlawfully exceeded its statutory limitations."
- The "separate subsidiary" provisions of the decision, as they apply to GTE, are "both irrational and [go] beyond the commission's jurisdiction" by forbidding the subsidiary to market both enhanced services and terminal equipment.

These objections and probably others will be included in the petitions for reconsideration that Telenet and other respondents were scheduled to submit to the FCC late last week. A future issue of *Computerworld* will cover them in greater detail.

Tymnet's Position

In addition to Telenet, Tymnet, Inc., — the nation's other major packet-switched value-added carrier — asked the commission early this month to defer the effective date of its May decision.

Tymnet's key point was that the distinction between regulated (basic) and unregulated (enhanced) telecommunications services, as stated in the decision, is fuzzy. Therefore, Tymnet cannot determine which of its offerings should and should not be tariffed.

Specific examples were not given in the company's FCC filing, but a spokesman pointed out that Tymnet's services involve error correction and alternative routing as well as speed and protocol conversion. The first two functions are components of basic services as defined by the FCC decision, while the latter two are attributes of an enhanced service.

CCIA's Criticism

Additional criticism of the decision was voiced by Jack Biddle, president of the Computer & Communications Industry Association (CCIA), in an interview with CW last week.

Although the FCC has required AT&T to market enhanced services through separate subsidiaries, the separation is not "meaningful," Biddle said, because "no separation requirements whatsoever are imposed on the manufacturing of equipment or the development of software."

Under legislation enacted in 1969, AT&T, along with other public utilities, receives tax breaks that reduce its effective tax rate to "about 9%," Biddle contended. If the FCC's May decision is implemented, the competitive subsidiaries will receive this same benefit, he explained.

In addition, Bell Laboratories will continue to receive a subsidy, in the form of license fees from the operating companies, which come originally from the users of their services. This subsidy, according to Biddle, will help subsidize Bell Laboratories' development of competitive products and services.

The license fees amount to about $1.2 billion annually, Biddle said. They provide half of Bell Laboratories' telecommunications research and development budget. The other half comes from the work Bell Laboratories performs for Western Electric Co.

Since these costs are added to the price of the equipment Western Electric sells to the Bell operating companies, "they also are paid, ultimately, by the telephone network user," Biddle said.

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Security Only as Good as Administrators

(Continued from Page 1)

curity Administration made a mistake that cost the government $1.2 billion in overpayments before it was finally corrected.

The only reason many companies bother with DP security at all is the recently passed Foreign Corrupt Practices Act, which dictates that all publicly owned companies must have effective internal accounting controls, the consultant said.

The law has had "a salutary effect" on computer security and has goaded management into a "tremendous upswing" of activity to comply with it, he added. It is enforced by the Securities and Exchange Commission.

Six "bad" things can happen to data, he said: It can be purposely disclosed, modified or destroyed or accidentally disclosed, modified or destroyed. All six can be prevented if DP security is developed through risk analysis and backed up by a well thought-out contingency plan.

Risk Analysis

Risk analysis must consider probabilities as well as dollars, Courtney said. Although one-third of a million dollars might sound like a lot of money to spend on security during the course of a year, it could prove to be much less expensive than risking the possibility of a 1%, $10 error rate over a half-million daily transactions.

A good contingency plan should be oriented toward minimizing loss, not recovering from total disaster, the consultant said. Only one in every 2,500 DP centers suffers such a wipeout each year.

One mistake is to protect hardware from fire damage while leaving paper, which is far more combustible, unprotected, Courtney maintained, adding "I can get you a new 158 in three or four days, but it can take four to six weeks to replace preprinted forms. You should make sure all the things you are continually dependent on are backed up."

He also warned against falling into the trap of depending on mutual aid agreements in which one DP center agrees to provide its computer services to another in case of disaster. The chances of such an agreement working out for either party are "vanishingly small," he said.

Backup Plan

A more reasonable approach to disaster backup involves putting 20% of the total DP system at another site, thus providing a backup for the 18% to 20% of DP tasks on which users are "critically dependent," Courtney said.

Most people don't even realize what the most critical DP functions are, he added, listing identification, authorization, surveillance and systems integrity as the most important.

Users are granted too much anonymity and in many installations, password systems have yet to be implemented, Courtney explained. Magnetic credit cards can be useful, but logos, pictures and other information should be left off them, making it more difficult for a would-be imposter to use such a card illegally.

Although surveillance has been eschewed in the past as being too expensive, the consultant called that argument "simply a myth," and asserted DP systems can very easily and inexpensively compile lists of users.

In the area of systems integrity, vendors are doing more than users to make systems secure, but both are at the mercy of unscrupulous applications programmers who can easily do purposeful damage, he maintained. This condition can be alleviated by limiting the size of modules so auditors can understand them.

Further Impediments

Other impediments to higher DP security Courtney mentioned included disgruntled employees, water damage, eavesdropping and wiretapping.

Disgruntled employees are part of a "management problem" that grows over time, usually becomes self-evident before trouble starts, but is just as often ignored because managers do not want to get involved in "messy personnel problems," he said.

Water damage is inexcusable and may be caused because someone was too lazy or unintelligent to cut out a piece of polyethylene to cover a machine exposed to dripping water, he said.

Eavesdropping and wiretapping, while possible, are not widespread, Courtney said. There is no instance where invaders have been able to pick up emissions by a terminal and use them for their own purposes, he said.

Wiretapping is not pervasive and the consultant pointed out the low sales of cryptographic devices to support that argument. "There may be some financial institutions that can use such devices, but I think it's easier to buy a competitor's employee than to wiretap his company," he said.

Catalyst in Overcoming Resistance

Security Director Called 'Man for All Seasons'

By Bruce Hoard
CW Staff

NEWTON, Mass. — The corporate security director is a man for all seasons who must be responsible for corporate security from the cradle to the grave, John Pulcini, corporate security director for the Norton Co., said at the Computer Security Conference here last week.

"Resistance to security controls at all levels is a major challenge to our profession," he said. In order to overcome that resistance, all elements of a company must be involved in forming a comprehensive security plan.

The corporate security director must be the catalyst in bringing those people together, coordinating them and setting goals and a timetable. Much of this planning must be done before any security plan is presented to top management, Pulcini explained.

"The corporate security director must understand the nature of the beast in order to form policy to be implemented by line managers," Pulcini said. He must also be a salesman who can convince people to spend money in a tight economy for a problem that may never happen.

The starting point for a good security plan is the preliminary session to exchange ideas according to the director. Ideas formed there can then be applied within the risk management group, which becomes the focal point of the incipient security plan.

Risk analysis is essential to the development of a good plan and allows the corporate security director to get a handle on its development. Even companies with a security plan in place should perform a risk analysis on it because it could save money.

Protecting Assets

Once established, the risk management group should determine just what assets the company has to protect and decide on the most effective techniques to use toward that end. There are both hard and soft assets, Pulcini added.

Hard assets include hardware in the form of computers and peripherals and are fairly easy to protect because they are subject to risks with which the corporate security director has had to deal before — such as fire, sabotage and natural disasters.

In the area of fire prevention, rapid system recovery should be considered strongly, and subfloors should have drains to accommodate the flow of water that accompanies the use of sprinkler systems.

"Getting the fire out is one thing; getting back on-line is at least as important. Business interruption often costs more than the loss of hardware," Pulcini claimed.

Soft assests may come in a "hard" form, such as a reel of magnetic tape, but are more likely to be something less tangible like a payroll or inventory system or a trade secret. This area is not a traditional one for the corporate security director and poses more of a challenge.

He called data on computers "perhaps the company's single most valuable asset," and urged security directors to develop a thorough knowledge of it. That process can be greatly facilitated by working closely with the DP director.

In order to illustrate the wide range of knowledge a security director must have, Pulcini explained what constitutes a trade secret and how it must be protected.

Trade Secrets

Trade secrets — unlike patents, which are good only for 17 years — may be maintained in perpetuity as long as they are protected properly and that means making a deliberate, consistent effort to protect the secret from general disclosure.

If, however, a trade secret is loosely maintained in a computer room and falls into the hands of a competitor who then uses it for his own devices, the company relieved of the secret will be unable through the courts to restrict its use elsewhere, Pulcini said.

"People and information have to be controlled. The greater the accessibility to the data, the greater the risk it will be compromised," he added.

The corporate security director should develop periodic security audits to be run in tandem with computer audits. The lack of qualified DP auditors is holding that strategy back.

A successful corporate security director must "be a barker, an Ayatollah and a Kissinger," Pulcini said. He should not equip himself with buzz words and try to fake it, but develop a working knowledge of the task.

"If you don't know, get out there and learn," he concluded.

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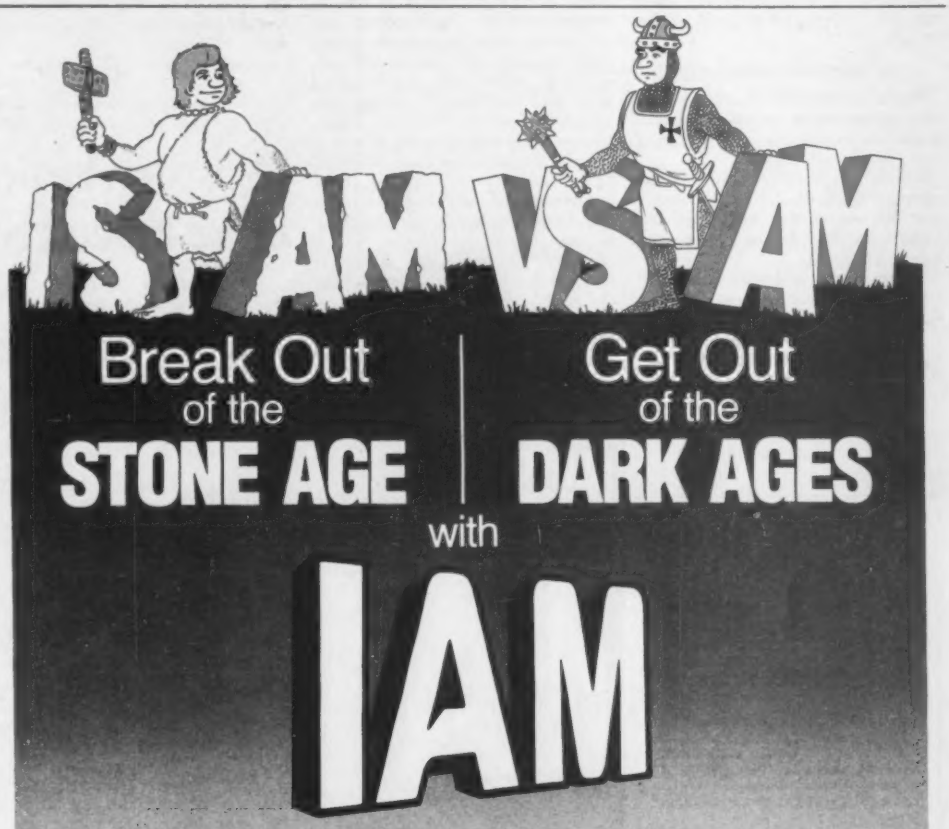

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Sharpen Definitions

Bring DP Crime to Light, Security Pros Told

By Bruce Hoard
CW Staff

NEWTON, Mass. — Computer security professionals are under attack because they have failed to define computer crime and convince people that it really exists, according to Brandt Allen of the University of Virginia.

Allen made his remarks at the Computer Security Conference held here last week and sponsored by the American Society of Industrial Security.

He quoted testimony from congressional hearings in which witnesses claimed computer crime is "a rare and insignificant problem" and "a bogus issue."

"What those statements are saying is that we are a bunch of frauds," Allen told his audience of security professionals.

Sources of Confusion

People are confused about the nature of computer crime for several reasons, including money, politics, semantics and poor data, Allen said.

Money is a hangup because "some people's pocketbooks are showing," and they are reluctant to pursue computer crime they do not believe really exists, Allen said.

Politics comes into play because S. 140, the Senate bill which would make it a federal crime with stiff penalties to abuse any modern computer system, has sparked a lot of extreme and contradictory comments, he added.

The problem with semantics is, "We just don't have good definitions of the terms we're talking about. We still don't have a good definition of computer crime." Half the confusion over computer crime could be eliminated if definitions were sharpened, he said.

A Means or an End

Two categories of computer crime are important, and they include situations where computers are used as a means to an end and those where the computer is an end in itself, Allen said.

The computer acts as a means when fraud, abuse and privacy violations are involved, and as an end when sabotage to the computer or theft of such elements as software, computer time or data are concerned, he explained.

Computer fraud is frequently perpetrated through unlawful manipulation of input, Allen said. Unauthorized data may be added, changed or blocked.

Conversely, output is also subject to illegal intervention and can be altered by fraudulent embedded logic or the misoperation of a system in which certain data is selectively not processed, he said.

Controls on transaction authorization and data entry are abominably lax and have led to several large and conducted rip-offs, Allen explained.

As an example, he detailed a hypothetical transfer of $5 million from a Boston company's bank account to another bank in San Francisco.

To effect the transfer, the company president calls his treasurer's office and asks "Sally" to transfer the $5 million to San Francisco. She then calls the bank, relays the request and it becomes a fait accompli, Allen said.

The problem is, he explained, Sally does not need a telephone call to initiate such a transaction and there is nothing to stop her form doing it at any time. "It's just flat-out wrong. Transaction authorization is a very important business function we do not want to delegate to data entry people."

In order to prevent such fraudulent schemes, management should ensure that important transaction requests are processed in parallel from the time they originate to their completion, he added.

Listing his top security priorities for the 1980s, he said responsibility for computer security is of vital importance and should not be shouldered by auditors or DPers alone. It "has to be absorbed by the people who use the computer."

Access Control

Access control must also be tightened up and a substitute for the password developed, Allen maintained. On a scale of one to 10, he rated the effectiveness of current password systems 2½. Unfortunately, there is nothing better right now, he added.

Another aspect of access control to be reckoned with is resource security. People must be kept in authorized work places and allowed access to authorized data only, he emphasized.

Auditing for DP is inadequate because many auditors come to DP facilities as "drop-outs" from other auditing areas. "They wouldn't recognize a disk drive from a water cooler." However, if they are given sufficent training and resources, their performance will improve, he said.

Western Union Set to Launch Low-Speed Switched Service

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — A new, low-speed switched data communications service is scheduled to be inaugurated Sept. 1 by Western Union Telegraph Co. After a one-year trial, and possible modification, it is intended to become a permanent offering.

Dubbed Intracompany Message Service (IMS), the service was designed primarily for users who do not have enough traffic to fully utilize Measured-Time Wats, a Western Union spokesman explained. IMS per-minute rates also are significantly lower than long-distance charges for most users whose low-speed traffic amounts to between five and 40 hours per month, he indicated.

IMS includes a new intelligent terminal and a "smart" network switching system designed to produce further economies, the spokesman continued.

In many dial-up and Wats networks, he pointed out, each terminal is polled from a central location and the customer is charged for the call even when the terminal has no data to send back. IMS uses a contention system instead. Terminals are on-line only when they have data to transmit.

If the destination station is busy, the data is "parked" temporarily within the network; it goes to Western Union's Infomaster store-and-forward switching center in Middletown, Va., and is subsequently delivered.

IMS Terminal

The new terminal has text-editing capability; provides operator prompting during message preparation; automatically dials, redials and receives calls; employs mnemonic station addresses; and offers several other special features.

Western Union developed the unit's specifications and is now making them available to "all terminal manufacturers," the spokesman said. He added that one manufacturer has decided to build the terminal and several others are "interested." He expects a minimum configuration of the unit to cost the customer "a little more than a TWX terminal."

Remote job entry and transfer of sales, order, account balances and similar data between remote locations and company headquarters are among the intended applications of the new Western Union service. Intracompany administrative messages are another. The new terminals also will be able to access Western Union's domestic telex and TWX network.

Master Control

Although the basic IMS offering employs Ascii format and a 110 bit/sec transmission speed, other protocols and speeds can be supported. However, a master control station arrangement is required. It costs $1,570/mo plus $1,370 for installation. This unit, which has 12 asynchronous I/O ports, can be programmed to support any of the widely used communications protocols and will send and receive at speeds up to 9,600 bit/sec, the spokesman said.

Proposed usage charges for IMS range from $156/mo for a maximum of 300 minutes of transmission to $912/mo for 2,400 minutes. Additional usage costs 34 to 46 cents/min. There is also a network access charge of $22.50 to $42.50/mo per station, plus a nonrecurring installation charge of $50.

The monthly access charge is dependent on the number of stations in the customer's network. For the first through the 15th, it is $42.50 for each. The charge declines for additional terminations and reaches $22.50 with the 51st station.

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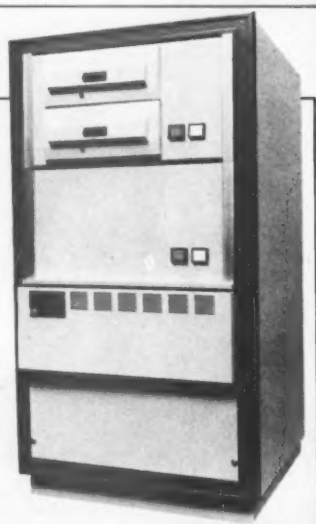

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For those who require even more hard disk storage, Ohio Scientific offers another microcomputer in the C3 Series, the C3-B. Its specifications are the same as those of the C3-C. However, the C3-B offers a 74 Megabyte Winchester drive.

For those who do not need hard disk capacity now, but in all probability will need it in the future, Ohio Scientific offers the C3-A. It is like the C3-B and the C3-C in all respects but two. 48K RAM is standard in the C3-A, and it offers 12 open slots. When more storage is needed, the C3-A is easily expandable to either a 23 Megabyte or 74 Megabyte hard disk system. The C3-A is priced at less than $6,000.

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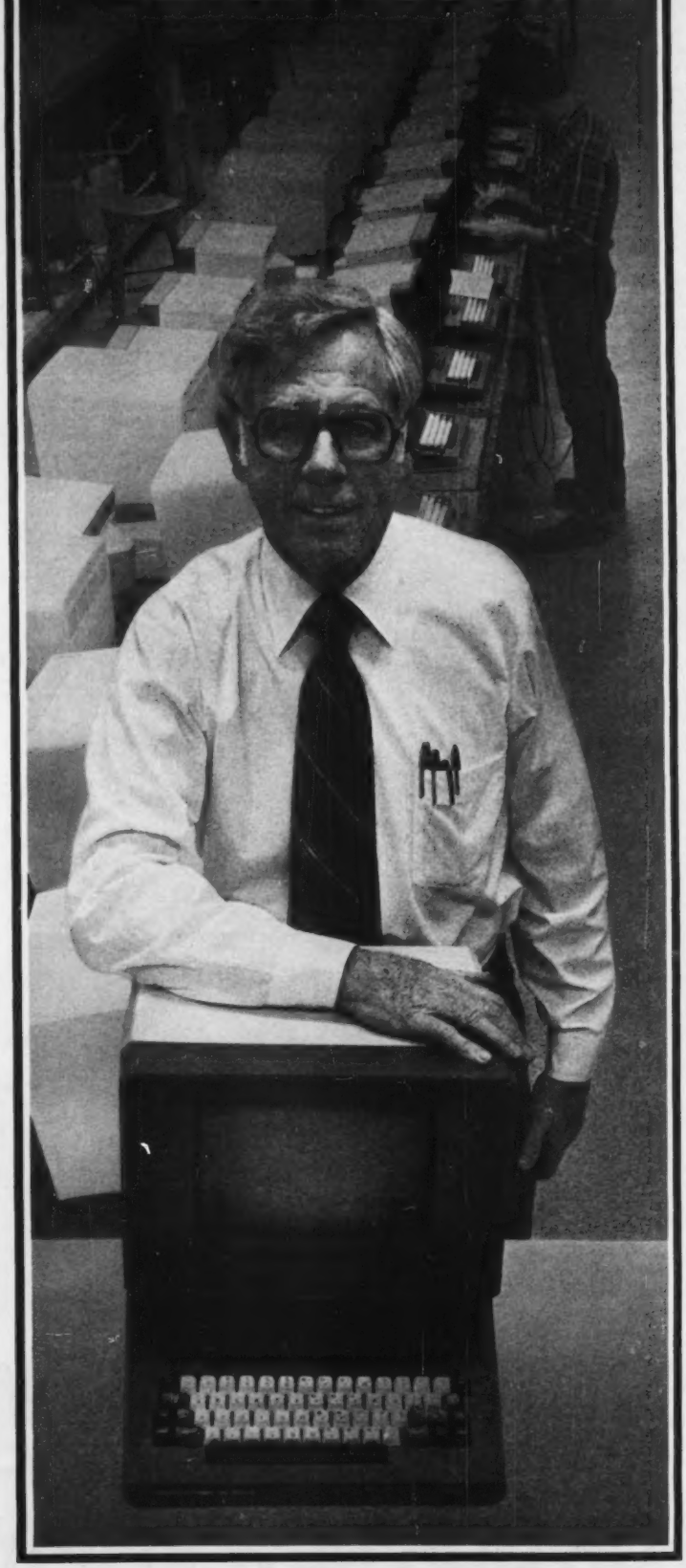

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PERKIN-ELMER

Tokyo's Ifip '80 Conferences to Rival NCC

By Tom Henkel
CW Staff

ANAHEIM, Calif. — For the Japanese, the National Computer Conference was a dry run. The real test will come this fall when Tokyo will host four major computer shows, collectively billed as Ifip '80.

Sponsored by the International Federation of Information Processing (Ifip), the Japanese shows will be a series of firsts. It will be the first time the Eighth World Computer Congress — one of the four shows — will be held in Tokyo. It will also be the first time Tokyo's newly opened Sunshine City convention center will be used for a major conference. And it will be the first time a computer show of international importance will be held in Japan.

The crowd expected at Ifip '80 should rival NCC, in the neighborhood of 80,000. In addition, more than 2,500 international visitors are expected to attend the Eighth World Computer Congress, according to Kaoru Ando, vice-president of the Ifip and liaison for the Japanese organizing committee for Ifip '80.

Most international visitors attending the computer shows will come for the Eighth World Computer Congress. That conference, scheduled for Oct. 6-9, will consist of 36 panel sessions and 113 submitted papers.

Half of that presentation will be repeated in the second part of the triennial event scheduled in Melbourne, Australia, Oct. 14-17. The other half of the presented conference material in Japan will be replaced by new material in Melbourne, Ando said.

'City Within a City'

Billed as a "city within a city," Tokyo's Sunshine City has more than 100 cafes and restaurants along with shopping, cultural and entertainment facilities, and it probably will not leave attendees wanting for things to do. However, the large center might also spark some confusion among international visitors.

Ifip recommends that conference attendees stay in Sunshine City's newly opened Prince Hotel. That hotel costs about $33 per night for a single room. However, most other hotels in the area cost about the same. Another advantage to staying at the Prince is that the registration booth for the conference will also be set up in the hotel lobby.

There are five session rooms set up inside the Sunshine City complex. Two are on the fourth floor of the adjacent Culture Center. Attendees will have to get from one building to another via a rooftop garden, a walk Ifip said will take a few minutes.

In addition to the conference rooms, a film theater and press room will be set up on the seventh floor of the Culture Center, Ifip said.

While sessions offered at the Eighth World Computer Congress will be similar to NCC, that conference does not offer an exhibition. To see hardware and related vendors, computer congress attendees will have to travel to the opposite side of Tokyo for the Information Processing Joint exhibition '80 (IPJE '80). The sponsors are Ifip Congress '80; Medinfo '80, which also sponsors the third show in Japan in the same two-week period; the Japan Electronics Industry Association; and the Communication Industries Association of Japan.

IPJE '80 will be held Oct. 3-8 in the Tokyo International Trade Center, in the southern part of Tokyo.

Operating under the theme "Information Processing Systems for Launching a New Decade," the conference will offer about 130 exhibitors. It will also be the first time non-Japanese-based firms will be allowed to exhibit at the show.

Formerly non-Japanese vendors had to exhibit through local distributors, according to Arthur Hutt, chairman of the U.S. committee to the Eighth World Computer Congress.

The invitation to non-Japanese vendors is a one-shot deal made especially for Ifip '80. Next year the show will revert back to its original ground rules, Hutt added.

Getting Around

Getting from Sunshine City to the International Trade Center could be a real challenge to a nonnative — especially one who does not speak or read

(Continued on Page 13)

Travel Detailed For Ifip '80

BROOKLINE, Mass. — The International Federation for Information Processing (Ifip) is offering a free brochure describing group travel packages to the Eighth World Computer Congress scheduled in Tokyo Oct. 6-9 and Melbourne, Australia, Oct. 14-17.

The brochure gives details on 12 group travel programs from Los Angeles and New York to Tokyo and/or Melbourne including special pre-conference and post-conference tours through Japan, Australia, the People's Republic of China, Hong Kong, Hawaii and other Pacific islands, Ifip said.

The brochure is available from the American Federation of Information Processing Societies (Afips) at Suite 800, 1815 N. Lynn St., Arlington, Va. 22209.

Additional information may be obtained from Garber Travel, which has arranged the travel packages, at 1406 Beacon St., Brookline, Mass. 02146.

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GAO Reports Deficiencies in Federal Auditing

By a CW Staff Writer

WASHINGTON, D.C. — "Ineffective programming, poor data or a combination of the two," coupled with "almost unquestioned acceptance of the output of computers as correct," have led to hundreds of millions of dollars in losses through "erroneous payments, ordering of unneeded items, incorrect eligibility determinations and the like."

In addition, insufficient computer system auditing at federal agencies fails to identify these problems, according to a recent General Accounting Office (GAO) report summarizing four years of investigating agency internal audit practices.

Because the government spends more than $10 billion annually to operate its 10,000-plus computer systems, this lack of proper auditing is a "serious deficiency," the GAO said.

The report was prepared, the GAO told Congress, to help newly created agency offices of Inspector General and other internal audit organizations to improve their audit activities.

Unreviewed Transactions

The summary of computer auditing problems, one section of a larger report on federal audit practices, claimed, "undetected data and programming errors cost the government many millions of dollars annually and can impede agency mission achievement."

The GAO noted more than one billion federal computer transactions a year covering:

- "Unreviewed authorizations for payments or checks (excluding payroll) totaling $26 billion."
- "Unreviewed bills totaling $10 billion."
- "Unreviewed requisitions, shipping orders, repair schedules and disposal orders for material valued at $8 billion."

The investigating agency also repeated an earlier warning that "computers have added a new dimension for potential crime." The report pointed to 1976 findings of 69 computer crimes "or other incidents" in federal agencies resulting in losses exceeding $2 million.

Corrective Action

Although some audit offices "have made significant contributions to their agencies' computer management," the GAO said "there is a long history of audit organizations' aversion to work involving computers and computer-based applications."

Some departments and agencies experiencing DP audit problems in the past have taken good corrective action, but, the report added, several audit staffs, claiming lack of technical competence in DP environments have "simply tried to avoid all contact with automatic data processing."

Some improvements in scrutinizing the quality and reliability of computer-provided information have been made, but they are not enough, the report said.

The Interior Department's Inspector General, for example, "recently reported that his office had 89 sensitive computer applications which should have been audited on a three-year cycle, but that their current cycle exceeded 30 years."

The GAO did note that "because long-term training is required . . . providing adequate coverage of computer systems will require time."

But, the congressional investigators warned, "effective audits of computers and applications require technical competence beyond that required of auditors in the past, and the time is long gone when auditors could both ignore computers and successfully discharge their responsibilities."

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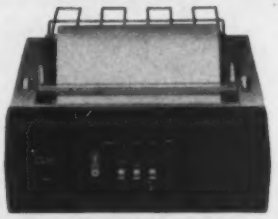

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Tokyo's Ifip '80 To Rival NCC

(Continued from Page 12)

Japanese.

The two convention centers are about six-and-a-half miles apart — as the crow flies. But one thing the crow does not have to contend with is Tokyo's traffic, because the six-and-a-half-mile difference is all downtown Tokyo.

Ifip has promised to provide multilingual escorts to aid groups of non-Japanese-speaking visitors. In addition, Ifip will offer shuttle bus service from Sunshine City to the International Trade Center.

Although the shuttle buses will be free, the fastest way to get from Sunshine City to the trade center is by the Tokyo subway system, an impressive maze of multicolored train lines.

Two smaller shows will round out Ifip '80. Medinfo '80, the third world conference on medical informatics, will be held Sept. 29 to Oct. 4 at the Medical Information System Development Center in Akasaka.

In addition, the Eighth International Conference on Computational Linguistics (Coling '80) will be held Sept. 30 to Oct. 4 at the Hotel New Japan.

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PANSOPHIC

To Respond to Corporate Needs

MIS Performance Boosters Offered

By Marguerite Zientara
CW Staff

ANAHEIM, Calif. — Corporate management information services (MIS) departments must improve their performance and value to their companies or be replaced by DPers with better organizational and managerial skills, according to Joseph E. Izzo, president of the Chicago-based management consultant firm Joseph Izzo Associates.

Speaking at a well-attended session of a major computer conference here recently, Izzo claimed that among corporate executive management, "two-thirds are dissatisfied with their MIS departments because DP is unable to respond to the daily needs of the organization."

Such widespread discontent stems from the fact that so many DP projects are not completed on time or within cost; from users thinking they are getting one thing and then getting another; and from the poor quality of systems that might, for example, take one to one-and-a-half years to become productive, Izzo said.

In an attempt to help solve the problem of poor MIS management, he suggested four "Techniques for Improving DP Staff Performance," the first of which is to match the allocation of MIS resources to the overall needs of the company.

"MIS departments could probably reduce their work effort by 25% by learning to be responsive to corporate needs and working on the right things," Izzo said.

Demand Index

In becoming more responsive to management, DP should first understand its demand index. Ninety percent of all requests to the MIS department take less than 20 days to implement, 9% take two to 12 staff months and 1% take more than 12 months.

"Currently, 120 to 200 days is the average turnaround time for minor requests." If those requests take only 25% of the DP work force," DP should develop programs to be responsive.

"We've made some major mistakes, and if we don't fix them we'll become very harmful to our corporations," Izzo admonished.

In order to adapt to the changing needs of the corporation every day, not every 90 days, DP departments should set up work request control systems that categorize requests as minor, intermediate and major projects.

"The system should allow the free flow of requests to the department, and DP should then be able to show management the true level of requests. Instead of just telling management 'we don't have enough people,' we must be able to show them exactly where our resources are allocated, so they'll begin to understand what resources are needed," he said.

In addition to a request control system, performance evaluation reporting should ensure that DP gets back to users "within a few days" to tell them how long a minor job will take and how much it will cost. Such reporting should also ensure adherence to a committed date on intermediate and major tasks.

The second of Izzo's four techniques for improving productivity involves the recognition of the DP department and its operations as a business within a business. "Unless you recognize that DP has a client base and a customer base, you can't succeed," he warned.

Users are dissatisfied because they experience a high frustration level when DP tells them, "We'll get to your job a year from now." Remember that DP is not the controller of the company, Izzo said, but rather executive management is the controller and DP is the provider of the computer services.

Just as corporations have for hundreds of years operated according to established organizational approaches in research, engineering, manufacturing, quality control, product delivery and support, marketing and finance, so must DP departments establish corresponding subgroups.

Noting that most MIS groups have no quality assurance program, Izzo claimed it is an essential ingredient for a successful DP department. "A quality assurance organization can turn an amateur group into a professional group within 12 to 18 months."

Furthermore, MIS must invest some time and money in the planning process. "While companies always say they don't have time for long-range planning, consider the fact that short-term plans always have long-term impacts that can be diametrically opposed to where you want to go.

"You must look ahead to the new technologies coming up, like office automation, and decide how you'll deal with them," he added.

Izzo's third method for improving productivity is the application of disciplined methods and practices that result in true professionalism. "Such fields as medicine and engineering have those methods and procedures, yet we've shied away from them."

Izzo's last and "very key" way to improve productivity entails the exercise of executive control from outside the MIS organization. "Executive management hasn't involved itself in MIS as much as it should."

IBM Asks to Call 124 More To Testify in Antitrust Suit

By Connie Winkler
CW Staff

NEW YORK — IBM wants to call 124 more witnesses in the U.S. vs. IBM antitrust trial to give foundation testimony on documents that have already been rejected by Judge David N. Edelstein.

This is another delaying tactic, the Justice Department immediately charged. The trial has been shut down 100 days while IBM prepares the last four regular witnesses who are now expected to testify in July or August.

IBM's head counsel Thomas D. Barr said at the June 2 chambers meeting that the list of 124 could be cut and that some witnesses would be on the stand only a few minutes to give foundation testimony — or substantiation that they authored the documents and had basis for doing so.

'Inappropriate' Request

For IBM to wait until the trial's 11th hour as it is nearing its end to call for 124 more witnesses is "inapropriate," said Robert J. Staal, who heads the government trial team. "It appears IBM is going into a stall in order to delay this complex trial," Staal said.

And what concerns Edelstein is that "You [IBM] have never raised the question in the slightest way. Don't come in as an afterthought. I feel as if I am being euchred," he said. The judge, who has been hearing the case for more than five years, has ruled on at least 20,000 documents.

Edelstein also said that in the future he wants foundation witnesses to testify when documents are presented and urged that this begin immediately. Barr said he was uncertain how quickly this could happen because he might have to subpoena these witnesses.

Edelstein must now rule on IBM's request foundation witnesses.

Staal was aggravated also by the delay in the preparation of narrative statements for IBM's next witnesses, four economists. The trial has been adjourned since March and the Justice Department has been waiting since April 7 for this direct testimony.

Barr said the 1,000-page narratives will be ready after July 4.

Delays in Testimony

"The assistant attorney general is strongly concerned about the delay in providing the narratives," Staal said, noting that the Justice Department is considering asking Edelstein to order IBM's economic experts to testify live.

Barr apologized several times for the delay, but contended that the process would ultimately speed the trial.

If the first economist had taken the stand in March, he would still be on the stand, Barr claimed, and he repeatedly pointed to the 78 days of testimony of government's economist Dr. Alan K. McAdams.

'Kneading' Records

While the trial has been adjourned, both sides and Edelstein have been processing 4,000 documents IBM wants presented; approximately 1,700 of these remain to be processed.

"The record is so huge that it is intellectually difficult to knead it together in a way that is satisfying to the expert who is testifying," Barr said about the long narrative preparation time.

Staal countered that this kneading was not the purpose of the narrative, and that IBM was making this a "dry-run trial brief. It seems to me unheard of to shut down the trial to polish and perfect testimony," Staal said. The use of written narratives was originally proposed to speed the trial.

Edelstein was less harsh on IBM about the narratives, and told Staal back to the Department of Justice and tell them to stop being so uptight and look at the facts of life."

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From Cockroaches to Moon Rocks

Smithsonian Computerizing Museum Inventory

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Name it and the Smithsonian Institution has it — from ant farms to moon rocks, Rembrandts to zircons.

But just try to find them.

The museum is not likely to misplace its 92-foot blue whale or Skylab mockup, but only a small fraction of the collection is on public display at any one time. The rest is locked away in vaults or gathering dust on miles of shelves.

These uncounted trays of insects, arrowheads and cat glands in the museum's 78-million-item collection have persuaded Congress and Smithsonian officials that an exhaustive, computerized inventory is needed to keep track of the world's largest museum collection.

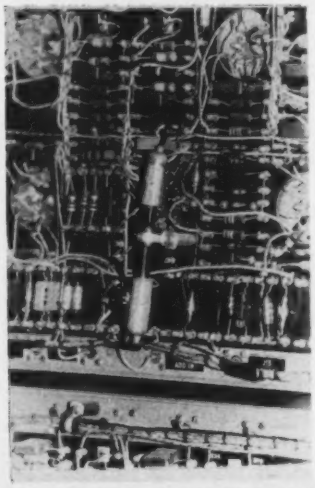
The staffs of the 12 separate Smithsonian museums are hard at work on a full physical inventory that is slated for completion by mid-1983. For technical expertise and DP resources, they are relying on the Smithsonians's Office of Computer Services.

"We provide the computer services and the programming and analytical support" for the inventory, Jim Crockett, deputy director of computer services, said. Crockett's Honeywell, Inc. Level 66 Model 20 shop provides the equipment, but the various museums' staffs do all the coding and data entry work.

Several Goals

Although Smithsonian curators are constantly reviewing and cataloging their collections, the full inventory was deemed advisable after museum officials had trouble accounting for some of the more valuable items supposedly in storage. Congress has appropriated $500,000 each of the last two years to speed up the work.

Besides facilitating collection management, the inventory will be invaluable to the research scientists using the Smithsonian's facilities, according to Crockett, whose 50-person shop also performs the museum's "bread and butter applications" — payroll, general ledger and the like.



Flip-flop storage for the Whirlwind computer was developed at MIT and dates back to 1945.

Crockett reported that some of the Smithsonian's smaller museums, such as the art museums, have already finished their inventories. But for some of the larger collections, the work is just under way.

The Museum of Natural History, for example, which alone accounts for an estimated 60 million items in the institution's possession, is far from finished with its mammoth count.

Those 60 million specimens translate into approximately 10 million potential computer records, according to Dr. Gary Gautier, chief of the Automated Data Processing program for the natural history museum. With his share of the Smithsonian inventory budget, Gautier has used as many as 88 temporary employees at one time to produce a listing now approaching two million records on 1,600 bit/in. magnetic tape.

Gautier, whose permanent staff of several dozen has been computerizing museum records since 1967, said the work is being done through on-site key-to-disk entry systems and coding forms that are scanned by outside contractors.

Individual records contain information on items such as catalog number, location and data on where and when individual specimens were collected — any information that would be of use

Burroughs Corp. Atlas guidance computer was used at Cape Canaveral, Fla., and was developed in 1956-57.

to researchers using the museum.

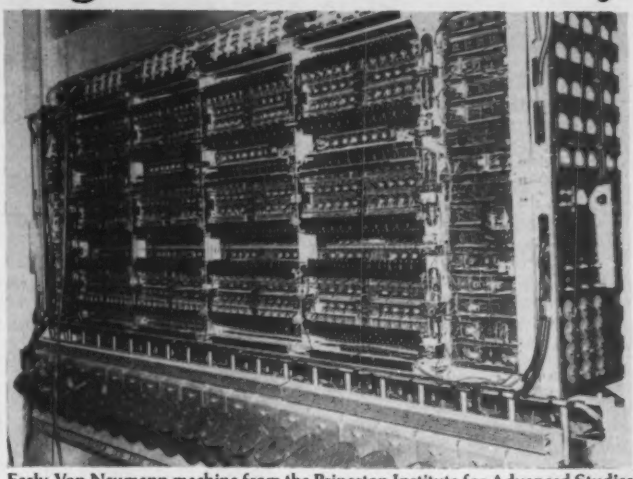
"Inventory policy requires us periodically to reinventory the collections," he said, noting the benefit of machine-readable records. But "this is basically a research collection with worldwide interest," and scientists need to know what the museum has, where it is and what its condition is.

Beyond inventory and research, there are additional uses for the machine-readable inventory, Gautier observed. For example, the museum is using its automated inventory to perform computer modeling to plan storage systems for a new building scheduled for ground-breaking this fall.

Guatier's DP staff of eight handles these and other tasks using the Smithsonian's central computer services office. Gautier's shop does very little programming itself, relying to a great extent on the resources of the central facility. The two offices coordinate work through batch and on-line mode processing.

"Most of the work is setting up batch jobs and doing small systems analysis for projects and controlling the work flow and operations," Gautier said of his operation.

One central facility service is storing Gautier's 1,500- to 2,000-reel tape library. He would rather not think



Early Von Neumann machine from the Princeton Institute for Advanced Studies was in use around 1952.

about how many additional tapes will be generated by the full inventory or even when the job might be completed, although the Smithsonian is studying ways to speed up the process.

Debugging the Count

"Probably it will mean we won't inventory everything," he predicted, noting there is little need to count all the insects being used in various natural history experiments. "To the scientists they're important, but nobody would want to come in and steal them. And that's where the inventory is focusing — to protect the objects that are susceptible to theft."

The museum does have some very valuable items — priceless paintings by the Old Masters, the 44.5-carat Hope diamond (the largest blue diamond in the world) and, of course, the original Whirlwind computer from MIT to name just a few.

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July 14-18, Saint Charles, Ill. — **Computer Systems Installation.** Contact: Arthur Anderson & Co., 69 W. Washington St., Chicago, Ill. 60602.

July 14-18, Dusseldorf, W. Germany — **Introductory APL.** Contact: STSC, Inc., 11 Clearbrook Road, Elmsford, N.Y. 10523. Also being held July 22-24 in Chicago.

July 14-18, Seattle — **Computer Graphics and Interactive Techniques,** Sponsored by the Association of Computing Machinery and Siggraph. Contact: Siggraph, P.O. Box 88203, Seattle, Wash. 98188.

July 14-18, Greenwich, Conn. — **How to Develop an Effective Long-Range DP Plan.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

July 15-17, Edmonton, Canada — **Auditing, Security and Controls.** Contact: Advanced Computer Techniques Corp., 222 N. Central Ave., Phoenix, Ariz. 85004.

July 15-18, Portland, Ore. — **Structured Systems Design.** Contact: Langston, Kitch & Associates, Inc., 715 E. 8 St., Topeka, Kan. 66607.

July 16-18, Lake Buena Vista, Fla. — **Computer Contracting.** Contact: International Computer Negotiations, Inc., 1331 Palmetto Ave., Winter Park, Fla. 32789.

July 16-18, Washington, .D.C. — **Word Processing Supervision.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403. Also being held July 21-23 in Boston.

July 16-18, Denver — **DP Disaster Recovery.** Contact: EDP Security, Inc., 400-2 Totten Pond Road, Waltham, Mass. 02154.

July 17-18, San Francisco — **Basics.** Contact: SAS Institute Inc., P.O. Box 8000, Cary, N.C. 27511.

July 17-18, Los Angeles — **Software Reliability.** Contact: Computing Trends, 6925 56 Ave. S. Seattle, Wash. 98118.

July 20-23, Snowbird, Utah — **Clinical Systems in Perspective: An Assessment for the '80s.** Contact: Hospital Information Systems Sharing Group, 2415 S. 2300 West St., Salt Lake City, Utah 84119.

July 20-23, San Francisco — **Expo '80.** Contact: The Optical Character Recognition Users Association, 10 Banta Place, Hackensack, N.J. 07601.

July 21-22, Cambridge, Mass. — **Improving Your Leadership and Management Skills.** Contact: Harvard University, Laboratory for Computer Graphics, 48 Quincy St., Cambridge, Mass. 02138.

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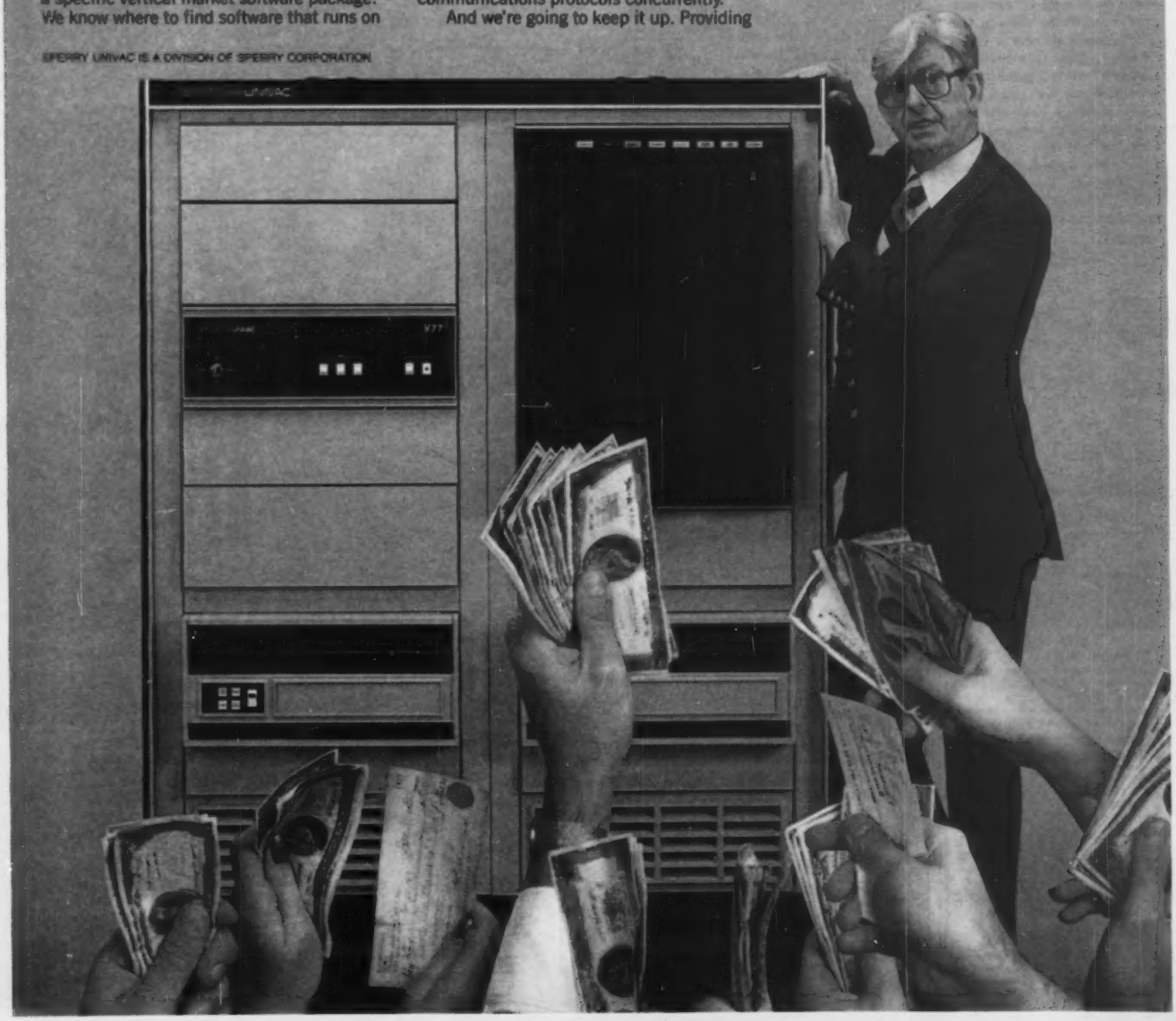


DPers Form 'Pier' to Swap Ideas on Productivity

By a CW Staff Writer

HARTFORD, Conn. — Although productivity is shaping up as the buzzword of 1980, few DP shops are able to define the concept, let alone measure it.

However, several DP managers in the Northeast recently joined forces to create the New England Productivity Information Exchange Roundtable (Pier), which will share ideas on the thorny subject.

Susan D. Hoben, a systems analyst with the Hartford Insurance Group, spearheaded Pier's organization after attending a productivity conference sponsored earlier this year by Guide, IBM's large users group. Hoben thinks Pier is the first round table exclusively dedicated to productivity.

Product Evaluation

The group, which now has 12 members and held its first monthly meeting recently, is not particularly concerned about how long it takes programmers to generate a specific amount of code.

Rather, Pier members will evaluate such productivity products on the market as analysis design tools and program generator languages. In addition, Hoben said the group will spend an equivalent time on "people productivity" issues, including hiring practices and motivation techniques.

Limited to three participants per member company, each monthly meeting will probe one topic.

This month's meeting, for example, will concentrate on data base administrators. The DP managers from the various member companies are expected to present their company's view on how data base administrators fit into their installations.

Aside from exchanging ideas on productivity issues, Pier members intend to develop some subjective guidelines for measuring the productivity of software tools, including stringent cost justifications, Hoben said.

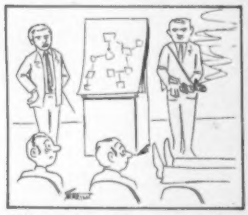
Despite a proliferation of products on the market, vendors have for the most part not been able to adequately measure the benefits of implementing the products, she noted.

Although the members' DP shops range in size from 40 to 2,000 people, all companies are committed to productivity improvement. Hoben's job at Hartford is entirely devoted to improving productivity, she said.

To create a better understanding of how DP shops approach productivity, the members have catalogued the productivity efforts under way at their companies, commenting on the strength of specific tools and techniques.

In addition to the Hartford Insurance Group, other founding members of Pier are Massachusetts Mutual Life Insurance Co., the Travelers Insurance Companies and Combustion Engineering.

Further information on the round table is available from Hoben at the Hartford Insurance Group, Hartford Plaza, Hartford, Conn. 06115.



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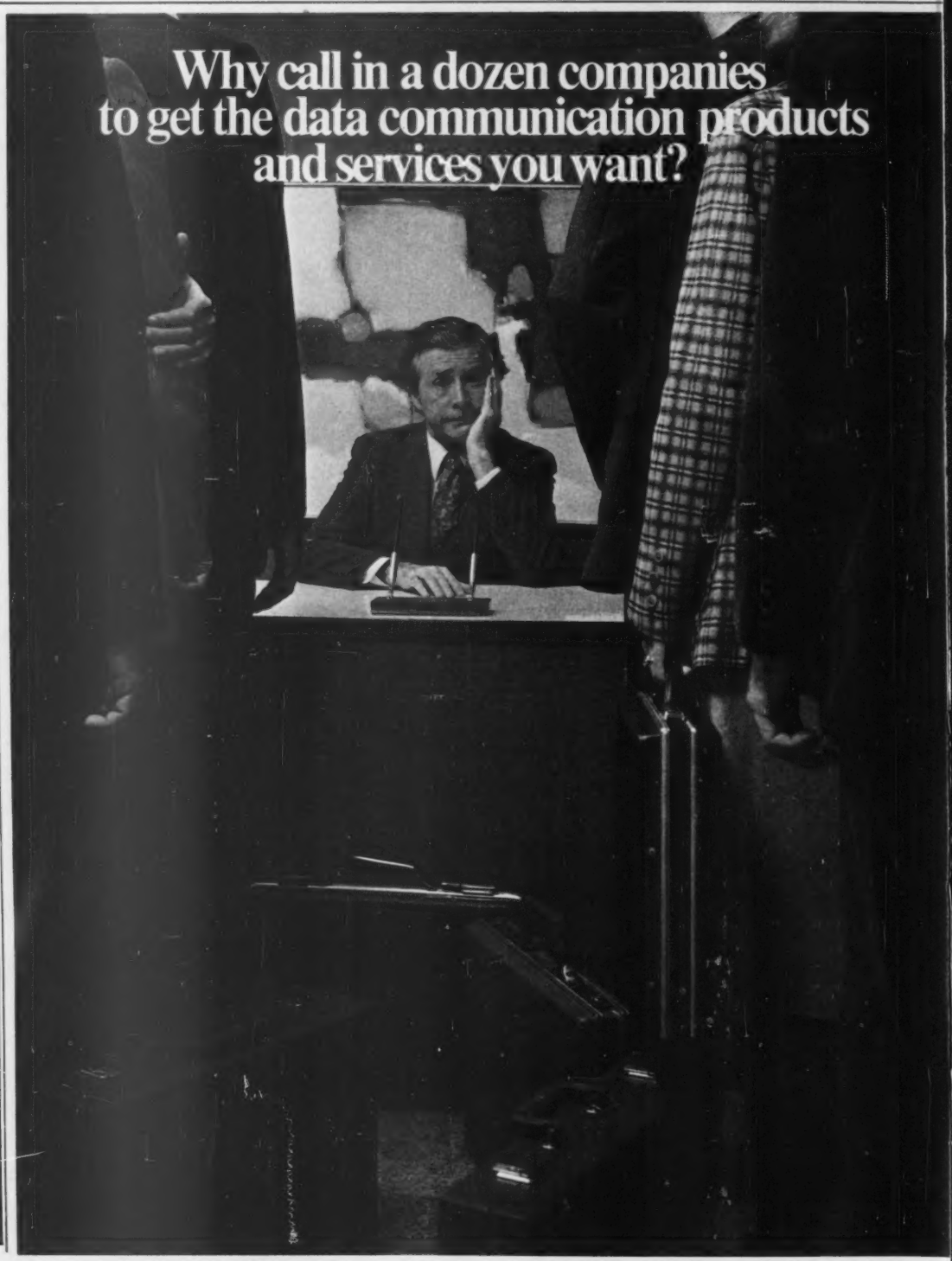

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Supply Sources Hard to Trace

Applications Software Tops User Group Issues

By Jeffry Beeler
CW West Coast Bureau

SAN DIEGO — Applications software — and questions about how to obtain it — apparently dominated the thoughts of many of the estimated 400 visitors who attended Prime Computer, Inc.'s fourth annual user group meeting here last week.

For many of Prime's customers, applications software is proving an unexpectedly-difficult commodity to come by. So difficult, in fact, that some of the attendees at last week's meeting were reportedly quizzing each other for names of possible suppliers.

The problem is not necessarily that the needed programs do not exist. The hitch, rather, is that the sources of supply — especially for highly specialized business or technical applications — are sometimes difficult to trace, according to Charles "Bill" Skaug, DP director for Bob R. Anderson Co., a Lockeford, Calif.-based steel building supplier.

None of the applications software Prime's users run on their systems comes directly from the vendor itself. The programs are instead supplied entirely through third parties, particularly systems houses and software houses.

Central Directory

Prime does maintain "quite a good" central directory of its third-party software vendors and their products, according to Dennis Cook, who last week relinquished his title as Prime User Group (PUG) president.

But like most other reference guides of its type, the Prime directory is not always as comprehensive or current as some users would like, Skaug said.

The result is that, in checking the directory, users are sometimes frustrated to find a listing for just about every type of application package imaginable — except the one they need.

Thus, the only other recourse many users have in trying to track down a desired application package is to seek out other users.

For at least some PUG members, therefore, last week's gathering presented a "prime" opportunity to scratch for leads in their continuing search for new applications, Skaug said.

Changing Focus

Another participant in last week's meeting — former PUG President John Steffen — offered a slightly different interpretation of the gathering's purpose and significance.

When the user group first met four years ago, almost all the members were up in arms about the generally poor quality of Prime's documentation. In fact, many members complained so bitterly that the vendor was forced to correct the problem promptly, Steffen recalled.

This year, however, circumstances are different. No single, overriding issue dominated the sessions, as the documentation problem did during the 1977 get-together, Steffen said.

Instead, users saw the meeting primarily as an opportunity to swap professional tricks of the trade and to seek solutions to relatively small, highly technical problems that are unique or nearly unique to their own installations.

Most of the inevitable complaints about product bugs or field service shortcomings were aired during a one-day "gripe session" that took place during the meeting's closing day. Admission to the closed-door session was restricted to Prime users and the vendor's top executives.

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Role of FTC Unresolved In Standards Making

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Federal Trade Commission (FTC) is analyzing recent legislation to see how it affects commission authority to intervene in standards-making activities, including DP standards.

An FTC proposal to involve itself in standards activities of a number of different industries was the subject of lengthy debate on the complicated FTC reauthorization bill. The legislation, held up for months with arguments about such things as FTC regulation of the funeral industry and children's television, among others, was signed into law by President Carter recently.

The commission's proposed rule making on standards and certification is of interest to the DP industry because one of the cases involved in the investigation was of the American National Standards Institute's (Ansi) consideration of a proposed I/O interface standard.

The proposed standard, eventually adopted by the federal government for use with its own DP systems, was rejected by Ansi. The Computer & Communications Industry Association (CCIA) argued before the FTC that Ansi rejected the standard because the institute is controlled by large mainframe manufacturers that opposed the proposal [CW, July 16].

The Computer and Business Equipment Manufacturers Association, which serves as the secretariat for Ansi DP activities, countered the CCIA assertions in an FTC filing last year and urged the commission not to interfere in DP standards making [CW, Feb. 14, 1979].

Legislation's Effect

What is not clear at this point is how the FTC legislation will affect the proposed rule making. Under a compromise reached reached by the Senate and the House of Representatives, the FTC cannot regulate trade groups — such as Ansi — that set industry standards in the name of curtailing "unfair or deceptive acts or practices."

But authority for the commission to act on "unfair methods of competition" was retained in the compromise.

The proposed standards rule making was not brought under any one specific section of the FTC charter, however, so "the effect [of the legislation] is not clear," according to Robert Schroeder, an FTC staff attorney working on the rule making.

"We have to get instructions from the commissioners as to how they want us to proceed," he said. He did point out that the arguments raised in the I/O standard controversy "fit under the unfair methods of competition," which would seem to suggest DP standards making could still be targeted for FTC regulation.

In addition, "the legislation does not affect in any way our ability to bring individual cases," Schroeder said. It only affects how the cases can be handled.

Decision Near

But the net effect is that the proposed standards rule making is up in the air, Schroeder said. A decision on how, or if, to proceed with the rule making should be made in about 30 days.

In the meantime, the commission staff will continue to analyze the data it has collected in its standards investigation to date — all 80,000 pages of it.

Further complicating the issue is that, as Schroeder noted, "there is some controversy over whether we have rule making authority under section 6," the section of the FTC charter dealing with unfair methods of competition. This point was discussed during the congressional debate on the bill.

Sen. Jack Danforth (R-Mo.), ranking minority member of the Senate Consumer Subcommittee, said recently that the unresolved issue of whether the FTC can invoke antitrust considerations in its rule-making activities "will undoubtedly result in lengthy legal disputes between standards-setting organizations and the FTC."

One instance of FTC rule making under this section of its charter was successfully upheld in court; but, Schroeder noted, this authority could conceivably be struck down by other U.S. courts. In that event, it would be up to the U.S. Supreme Court to decide the issue once and for all, he said.

IEEE Conference Set for November

WAKEFIELD, Mass. — Economic stimulation via technological innovation is the theme of this year's Institute of Electrical and Electronic Engineers (IEEE) Engineering Management Conference to be held here Nov. 12-14.

As well as covering such areas as technology forecasting, technology transfer, the changing patterns of management and new business in the economy, there will be special sessions and executive round tables on other topics of interest.

More information is available from Pala Pierce, IEEE Conference Chairman, P.O. Box 361, Acton, Mass. 01720.

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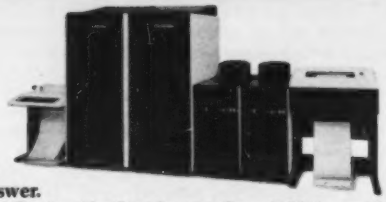

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Micro-Based Units Help Locate Lightning Fires

By a CW Staff Writer

WASHINGTON, D.C. — Small networks of microprocessor-based lightning detectors are helping the Bureau of Land Management (BLM) here control the severity of lightning-caused fires in remote areas of the western U.S.

The bureau is trying to stop the 50 or so major conflagrations that occur yearly in BLM lands west of the Rocky Mountains by installing detectors that communicate evidence of lightning strikes to fire fighters in the area.

Four detectors cover each area owned or managed by the bureau west of, and including, the states of New Mexico, Colorado, Wyoming and Montana. The Intel Corp. 8080 microprocessor-based units, made by Lightning Location and Protection, Inc. of Phoenix, Ariz., are connected over 300 bit/sec phone lines and modems to a Tektronix, Inc. 4052 graphics display, a 4631 graphics printer/plotter, a Lightning Location position analyzer and a Texas Instruments, Inc. Model 743 terminal printer, according to Steve France, who handles the bureau's Lightning Triangular System (LTS) from Washington.

The system derives its name from the method used to locate the position of a lightning strike. Each detector has a range of 275 miles, and the four detectors are positioned close enough together to overlay coverage of the area. When a strike occurs, the detector measures how far away it took place and sends an analog signal over phone lines to the station that houses the position analyzer and other terminal gear.

The position analyzer chooses the two strongest signals and determines the position of the strike within the area by triangulation, a , technique similar to that used by ground tracking stations to locate the position of aircraft.

The strike location appears on the graphics CRT terminal and is simultaneously fed into the TI 743, which prints the latitude and longitude of the strike location. The Tektronix printer plotter, connected to the Tektronix terminal via a parallel bit stream, prints the strike position on an outline map of the region, France explained.

Once the strike is registered, the office responsible for patrolling the area sends out a crew in a truck, if the fire is close by, or in a plane if it is some distance away. If they find the lightning has started a fire, its size is gauged and appropriate equipment and manpower are brought to bear in order to put it out.

Ignoring False Alarms

To eliminate the possibility that a false alarm will put a crew into motion, the detector was designed to ignore cloud-to-cloud discharges and to report cloud-to-ground discharges, which in some areas of Idaho and Colorado are responsible for 90% to 95% of the fires reported over the last two years, France said.

The fire detection system got its start six years ago when detectors were put into the Alaskan Wilderness lands managed by the bureau. That state had been patrolled by a leased jet that made periodic flights of areas prone to catching fire. The money saved in one year from discounting the constant plane flights and instead installing detectors throughout the bureau's land holdings in Alaska paid the $500,000 cost of the 22 detectors and associated computer equipment used through the western U.S., France said.

Groups and local governments outside of BLM lands are taking advantage of the pioneering work of BLM and are installing systems developed by Lightning Location and Protection in their own areas. The California Division of Forestry, the U.S. Forestry Service and Fort Defiance at the Navaho Indian reservation in southern Arizona are among those who have their own lightning strike analysis equipment.

Information from the fire detection outposts is desseminated to a wide variety of sources such as the U.S. Weather Service and the Federal Aviation Administration, which uses the information to direct planes around turbulence accompanying lightning strikes, France noted.

Network Plans

But the growing number of calls for information has caused the bureau some difficulties in filling the requests, so it is now considering the possibility of building a data network that will tie all of the lightning detectors and position analyzers together under the control of a large CPU.

"It is a burdensome task to disseminate data to all the agencies who want it," France explained. "We plan to get the CPU and those position analyzers now spread over the country and consolidate them in one place. Trained operators at the position analyzers can then work with lightning data and sort it on the CPU, then send it only to the area or areas that need it. It would also reduce our communications costs."

But for now, BLM is "playing it low key," working to rid the system of errors which sometimes place the location of a strike as far as 10 miles away from its indicated location.

Once that is settled, the BLM expects to gather weather data from solar-powered stations, transmitting such information as wind speed, direction, temperature and humidity to a satellite. Combined with data on lightning strikes, the information would enable fire crews to determine how fast a fire would spread and in what direction. They could then plan the most efficient and least costly method of containing it.

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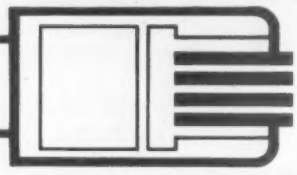

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Service Bureau Lauds Key-to-Disk

LOS ANGELES — Stat: Tab, a division of Statistical Tabulating Corp., credits its key-to-disk system and network communications package with contributing significantly to the company's success in functioning as a national service bureau. The company has divested itself of all batch processing operations except in Nevada and Arizona and is now operating as a service bureau and time-sharing operation.

"We must have the kind of gear that we can put a great deal of faith in," Jim Friedl, vice-president of special services, maintained, "and this Keybatch package, from Northern Telecom Systems Corp., allows us to place mainframe power at remote sites. For us to get a mainframe operational would take a $1 million investment [and] six months of effort. With this system, it's a $40,000 investment and we can be up and running within 60 days."

Approximately four years ago, Stat: Tab installed a Northern Telecom system to begin communicating some of its heavier processing requirements to two duplexed IBM 370/158s in the company's Chicago headquarters. The current configuration includes "about a dozen" IBM 360/30s at various sites, two Northern Telecom Model 75s and one Model 76 in Los Angeles and a Model 74 with five keystations and 5M bytes of peripheral storage in Reno, Nev.

Major Products

The company's major products include payroll, accounts receivable, sales analysis, general ledger/financial reporting, accounts payable, account or club billing and inventory control systems, and it also offers time-sharing on the 370/158s.

In addition to equipment and communications network reliability, Friedl cited the Keybatch system's editing capability and the 1,000 line/min printer included with the system as reasons for going with that equipment.

He recalled an incident more than a year ago when a disgruntled janitor employed by a company located in the same building as Stat: Tab's Reno operation firebombed the structure. The entire building was gutted. Friedl noted that "within 72 hours, the entire installation was operational in temporary headquarters and not a customer missed getting his payroll. The people from Northern Telecom were right there."

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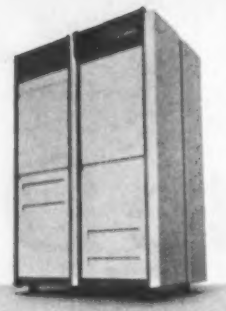

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As Part of USPS Conversion Effort

Nine-Digit Zip Trial Tapes to Go to 25 Mailers

WASHINGTON, D.C. — Twenty-five large mailers and service bureaus will soon receive U.S. Postal Service (USPS) data tapes containing nine-digit Zip Code data for five U.S. cities as part of a test to evaluate the tapes' usefulness, according to postal officials here.

The mailers and service bureaus will use the tapes to convert their computerized address lists to the nine-digit Zip Code. The test is part of a USPS effort to convert to the longer Zip Code on a nationwide basis by February of next year.

The mailers are slated to receive the trial tapes because they will be among users who are most affected by the upcoming change. Service bureaus were also included because they are expected to provide conversion data to most other commercial users, explained Dick Funck, chairman of the Computer Interface Committee for the Mailers' Technical Advisory Committee.

The advisory committee is composed of representatives from various trade associations and advises the Postal Service on technical aspects of its operation.

The five cities coded for the test are Hartford, Conn., Baton Rouge, La., San Jose, Calif., Lincoln, Neb., and Harrisburg, Pa. Funck declined to comment on which mailers and service bureaus would participate in the trial.

The mailers will receive data for all five cities on magnetic tape. The tape will contain present five-digit Zip Codes, street names, odd and even street sides and the name of the nearest post office, Funck said.

When the nationwide data base is finished, this information will be sent to users on 6,250 bit/in. tape, he explained. The entire data base is expected to fill between 17 and 20 reels.

Asked how long the test period would last, Funck replied, "We haven't determined that yet, but I would hope to have most of it completed by the middle of August. It depends on when I can get them out." His target date is currently July 1.

The mailers and service bureaus will be asked to evaluate their experience with the tapes so that USPS can make whatever changes are necessary to improve them before their nationwide distribution in February.

Call for Papers

INTERNATIONAL ON-LINE INFORMATION MEETING, London, Dec. 9-11.

Sponsored by *Online Review*, a journal of on-line and videotex information systems, the conference is seeking papers on the problems and opportunities in providing information to the business, industry, government and academic worlds. Papers reviewing present networks, systems and data bases will be welcome, costs of on-line and videotex systems, numeric data bases, information.

Paper titles and synopses should be submitted by June 23 to the Organizing Secretary, *Online Review*, Learned Information (Europe) Ltd., Besselsleigh Road, Abingdon, Oxford OX13 6EF, England.

COMPUTER NETWORKING SYMPOSIUM, Gaithersburg, Md., Dec. 10.

The symposium, sponsored by the Technical Committee on Computer Communications in the Institute of Electrical and Electronics Engineers and the National Bureau of Standards Institute for Computer Sciences and Technology, is based on the theme "Focus on Office Automation."

Papers of a tutorial nature that describe practical experiences or research dealing with office systems, office system components and interconnecting networks are desired.

Authors should submit four copies of a 1,000-word abstract by June 30 to the technical program chairman, Frank Brignoli, Executive Office of the President, 726 Jackson Place N.W., Washington, D.C. 20503. Notification of acceptance will be made by July 15; final papers are due by Sept. 15.

COMPUTER MEASUREMENT GROUP (CMG) INTERNATIONAL CONFERENCE ON COMPUTER PERFORMANCE EVALUATION IN THE '80s, Boston, Dec. 2-5.

The purpose of this year's conference is to better understand the financial impact of performance studies. Papers are encouraged in the following areas: computer and network performance, network design, system configuration analysis, capacity planning, tuning, work load characterization/forecasting, impact of performance on cost of ownership, reliability/availability/maintainability, prediction and analysis techniques and performance tools (load drivers, monitors, etc.).

Four copies of completed papers are due July 1; notification of acceptance will be made Aug. 15; and final, camera-ready copy is due Sept. 15.

Papers should be sent to Program Committee, CMG XI, Computer Measurement Group, Inc., P.O. Box 26063, Phoenix, Ariz. 85068.

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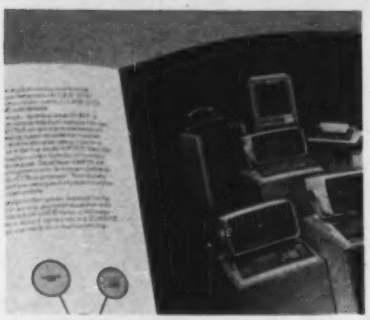

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Word Processor Envisioned for Ballet Scoring

By Phil Hirsch
CW Washington Bureau

ANAHEIM, Calif. — Ballet choreographers may some day do their work on word processing terminals, Stephen Smoliar, of General Research Corp., said here at a recent national conference.

Manual systems for representing (scoring) a ballet dancer's individual movements have been available for some time, but they have had a number of operational shortcomings and have suffered from additional infirmities familiar to those involved in other forms of programming.

The two most widely used ballet notation systems employ radically different syntaxes, making them totally incompatible. Each scheme has a devoted band of followers who believe theirs is the true way, Smoliar said. "At a time when it is hard enough to get the majority of the dance community to accept notation of any sort, such factionalism is of little benefit."

Notator's Role

The major operational shortcoming of both systems is that they require the use of a skilled technician known as a "ballet notator." Despite his skill, a notator frequently cannot record all the significant details of a ballet routine quickly enough, Smoliar explained.

A further complication is that scoring ballet is a three-part problem. The notator is a kind of stenographer who must record the creativity of both the choreographer and the dancer. Thus, even if the notations are literally complete, they may not be adequate.

The practical problem of getting the details down on paper is difficult enough. In most ballets utilizing a large number of dancers, he said, so much is going on in parallel that the notator must use "essential key symbols" that can be expanded later into detailed notations.

Errors are inherent in such a note-taking process. One way to minimize such errors is by checking the detailed score, as it progresses, with the choreographer.

But "as a rule, this process requires one or two hours for each hour spent in rehearsal," and it must be done before or after the rehearsal period. "Even if we overlook the fatigue of 12 hours of rehearsal time, there just aren't enough hours to keep up with the work" in this fashion, he pointed out.

Graphics Representation

Another major defect of present notation systems is that few dancers or choreographers know how to read the completed scores. "Not only does this mean that the choreographer is in no position to pass judgment on the accuracy of the score, but it also implicitly changes the notator from stenographer to ballet master, Smoliar explained. All of which produces yet another set of difficulties.

A word processor, besides simplifying the recording chore, would provide an easily comprehensible means of reading the completed score — in the form of a CRT display on which the ballet routines could be shown as still and/or moving graphic images.

The basic problem preventing the application of word processors to ballet notation is that "such a development project would entail a substantial expense for a product which would never be particularly widely used. "Thus, the development of the product itself could never be cost-effective; as a result, for economic reasons, the feasibility of the vision is pathetically low," Smoliar said.

Movement Simulator

While a prototype computer-compatible coding scheme for representing ballet routines has been developed, the semantic problems involved in interpreting these symbols remain to be addressed, Smoliar said. "What is required is the ability to construct a simulator of human movement. Given the existence of such a simulator, one may regard a notation score as a series of commands to that simulator."

One of the existing manual notation systems, generally referred to as "Labanotation," provides many of the logical concepts needed to build such a simulator.

For example, it defines the human form in terms of skeletal components that can be reoriented spatially according to specific commands.

"A simulator based on Labanotation principles has already been designed," Smoliar reported, but lack of an "angel" to fund further development limits its future prospects. "One can only hope that the need for the simulator may attract the interests of institutions better-endowed than a ballet studio. "It would not be the first time the arts [benefited from] a spin-off of a product of high technology."

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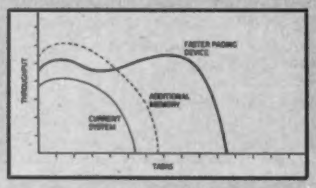

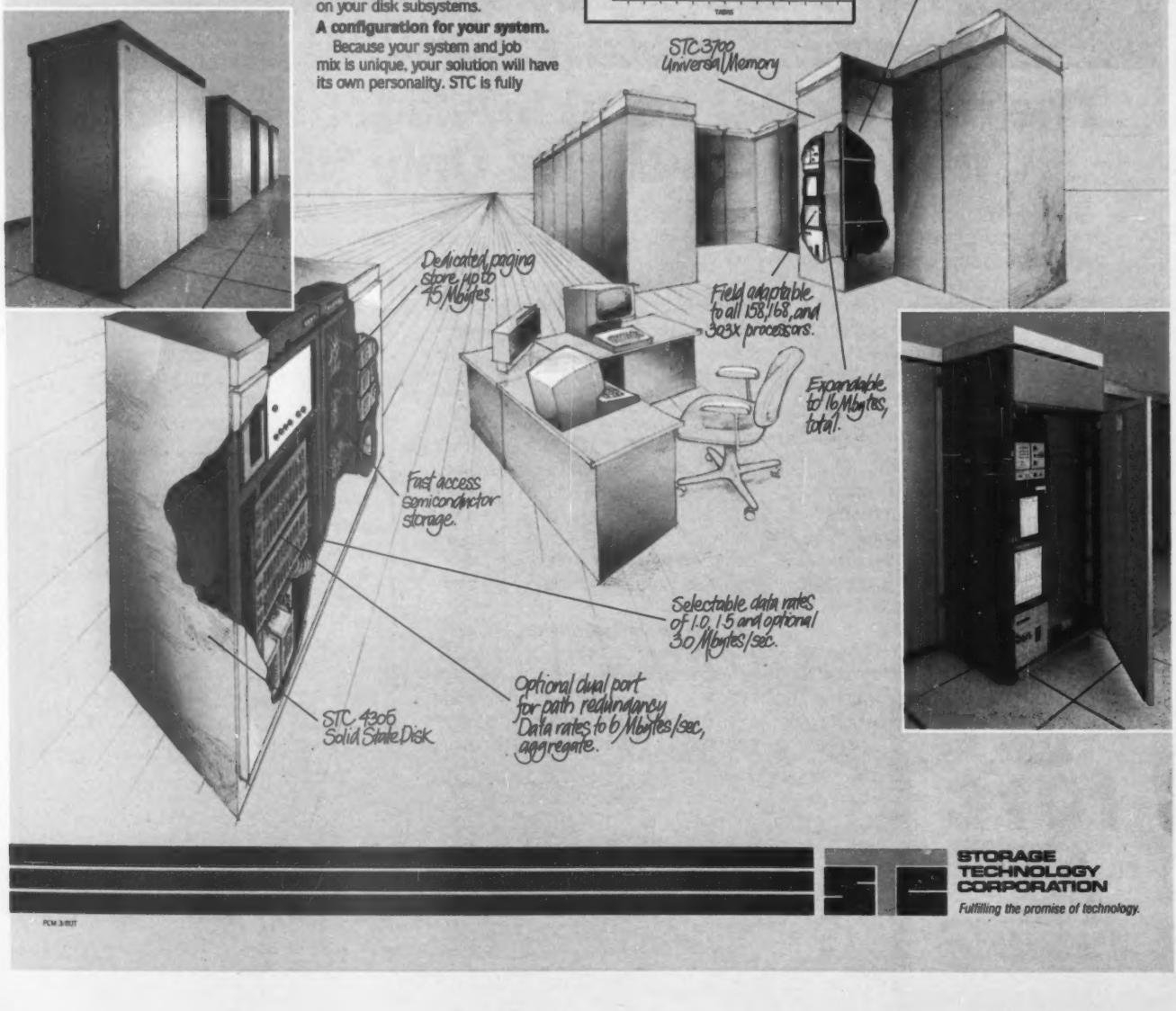

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Managers on the Move

Allan M. Kirk

Akiva F. Pipe

Reginald F. Fuller

Paul B. Dunlevy

ALLAN M. KIRK has been promoted to manager of electronic data processing at ITT Electron Tube Division in Easton, Pa.

Kirk joined ITT in 1978 and served as senior analyst and programmer before his promotion. Previously he served as a programmer and systems analyst for Riegel Products Corp. in Milford, N.J.

• • •

REGINALD G. FULLER has been elected vice-president of accounting and information systems at Washington Gas Light Co. in Washington, D.C.

Fuller has 32 years of service with Washington Gas in accounting, internal audit and information systems. He became manager of data processing development in 1969 and director of information systems in 1971.

Fuller holds bachelor's and master's degrees in business administration from Strayer College.

• • •

PAUL B. DUNLEVY has been appointed director, systems and data processing at Universal-Cyclops Speciality Steel Division, Cyclops Corp. in Pittsburgh, Pa.

Dunlevy, who joined Universal-Cyclops in 1961, most recently was manager of systems, and prior experience included various management responsibilities within the division.

Dunlevy holds a Bachelor of Science degree from the University of Pittsburgh.

• • •

AKIVA F. PIPE has been elected vice-president for information systems at American Water Works Service Co. in Haddon Heights, N.J. Pipe will be responsible for all information produced by computer systems

He joined the company in 1976 as coordinator of systems and procedures. He peviously had 19 years experience in DP, including four years as a programmer, 11 years as an RCA DP manager and four years as an officer of a consulting firm.

Pipe holds a business administration degree from City College of New York and is currently in the MBA program at Rutgers University.

• • •

LES CLARK has been promoted to director, management information services, at Marion Laboratories, Inc. in Kansas City, Mo.

In his new position, Clark will be responsible for computer-based and computer-assisted information systems, including strategic and tactical information development programs.

Clark joined Marion in 1976 as operations analyst and most recently served as director, information systems development.

Clark attended the University of Missouri at Rolla, where he obtained a bachelor of science degree. He holds an MBA degree in industrial management from the University of Tennessee, and an MA degree in economics from the University of Missouri.

• • •

RICHARD SWAN has been named director, management information systems, at Century Data Systems, Inc. in Anaheim, Calif.

He will be responsible for the installation and support of the Xerox Corp. Computer Services (XCS) system and for corporate information planning and studies. Swan was most recently manager, distribution development, for Xerox Computer Services.

Swan holds a bachelor's degree in economics from Stanford University and a master's degree in business administration with a major in finance from the University of California at Los Angeles.

• • •

RICHARD THOM has been named an assistant vice-president in the computer operations department at National Bank of North America in New York City.

Prior to joining the bank, Thom was employed with Unionmutual Insurance Co. in Portland, Maine. He has also been associated with Pennsylvania Blue Shield, Optimum Systems, Inc., Government Employees Insurance Co. and Computing and Software, Inc.

Thom has studied at the University of Miami. He is a member of the Data Processing Management Association and the Guide Users Group.

• • •

MARVIN L. SILVERMAN has been named manager of operations analysis in the DP division of Blue Cross & Blue Shield of Greater New York, Inc. in New York City.

Silverman's responsibilities include the analysis of the hardware and software environment, development of long-range strategic plans, recommendation of required hardware and software changes and/or acquisitions and analysis of overall workflows and controls.

Prior to joining Blue Cross & Blue Shield, Silverman was manager of computer technology for the Consolidated Edison Co. of N.Y., Inc. Other DP managerial positions included the American Express Co. and the Chase Manhattan Bank.

• • •

DR. A. NICO HABERMAN has been named head of the computer science department, Mellon College of Science at Carnegie-Mellon University in Pittsburgh, Pa.

Acting head of computer science for the past year, Dr. Haberman originally joined the university faculty as a visiting professor in 1968.

Dr. Haberman previously taught at Technological University in Eindhoven, the Netherlands, and also served there as program director of postdoctoral education in mathematics.

He holds degrees from Free University in Amsterdam and the Technological University in Eindhoven.

• • •

DAVID S. BLANK has been named manager, planning and assurance, EDWARD W. RITER has been appointed planning and assurance consultant, ORAN P. HALL has been named systems development manager and JAMES E. RICHARDSON has been appointed systems development consultant in the systems development division of Bethlehem Steel Corp.'s accounting department in Bethlehem, Pa.

Blank joined Bethlehem Steel in 1938 while still a student. He holds a degree in accounting from Bentley College.

Riter has been employed with Bethlehem Steel since 1957. Riter holds a B.S. degree in engineering from MIT.

Riter holds a B.S. degree in engineering from MIT and an M.B.A. from the State University of New York at Buffalo.

Hall was previously employed by Price Waterhouse & Co. and Jones & Laughlin Steel Corp. He joined Bethlehem Steel in January.

He holds a B.B.A. degree from the University of Pittsburgh.

Richardson was formerly employed with U.S. Steel Corp., American Roller Co., Wheeling-Pittsburgh Steel Corp. and Interlake, Inc. He joined Bethlehem Steel last August. Richardson received a B.S. degree in economics and doctor of jurisprudence degree from Northwestern University.

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VAX-11/780 Tapped for Biomedical Research

CAMBRIDGE, Mass. — Scientists here at Harvard University's Mallinckrodt Laboratories have switched from an IBM 360/91 to a Digital Equipment Corp. VAX-11/780 minicomputer for the biomedical research program.

Said to be the first time a VAX-11/70 has been used for such a project, the system — aided by a 600M-byte System Industries, Inc. disk storage system — supports two life science research projects: a molecular biological program to determine the structure of proteins and nucleic acids, and a program to develop theoretical calculations on the dynamics of molecules and proteins, according to Dr. Robert Ladner, a Harvard research fellow.

The Harvard scientists liked DEC's VAX-11/780 better than DEC's PDP-11 series — the school's second choice — because the 11/780 was better suited to handle a complex Evans & Sutherland Computer Corp. graphics system known as Multi Picture System. The school also needed a system that could display real-time vector graphics for viewing and photographic recording, Ladner said.

Storage System

What Harvard did not like about the 11/780 were the DEC disk drives that could be attached to it. "DEC had only offered a rather slow 200M-byte disk that was rather expensive. We looked at a number of companies selling disks and decided System Industries gave us the best support," Ladner said.

The school bought two 300M-byte storage module drives and linked them to the 11/780 via a System Industries 9400 controller. The drives gave the school 502M bytes of formatted storage, the vendor said.

One of the first users of the 11/780, Harvard installed its system in December 1978. When the Systems Industries disk system was installed shortly after the 11/780, it freed up a DEC RM03 67M-byte drive to become a dedicated peripheral on the System Industries drives. The RM03 had previously been used to store a limited number of user files, Lander explained.

When the System Industries drives went on-line, they virtually replaced the university's time-sharing IBM 360/91 connected to Columbia University via 9,600 bit/sec lines. Now, more than 90% of the researchers' work is done by the 11/780. Harvard plans to stop using the time-sharing system this July, according to Lander.

NYU DP Center Funded by IBM

NEW YORK — A Center for Research on Information Systems has been established at the New York University (NYU) Graduate School of Business Administration with a $375,000 grant from IBM. The NYU center will encourage research on important topics related to the management of information processing activities in organizations.

In contrast to traditional computer science research, the center will focus on the application, evaluation and management of computer-based information systems that assist managers in solving problems and implementing decisions.

The center is a part of the Computer Applications and Information Systems (CAIS) area at the Graduate School of Business Administration and is one of the few such university-affiliated research centers in the country. Established in 1974, it has 10 full-time faculty members.

A major research project involving the entire CAIS faculty has been the development of a prototype office automation and administrative support system. Studies are currently underway to assess the impact of computerized office procedures on the pattern of communications, the media for communications and office costs.

The center is expected to help consolidate research efforts at the school and to attract further funding.

IBM Users Group To Meet Oct. 12

CLEVELAND — Common, an IBM computer users group, will hold its next semiannual conference here Oct. 12-15 at the Hollenden House.

Celebrating its 20th year, Common is comprised of users of IBM System/3, System/7, System/32, System/34, 1800, 5100 series, Series/1 and the recently introduced System/38 equipment.

Registration fees for the fall 1980 conference are $100 for Common nonmembers, $55 for members and $70 for IBM personnel. More information is available from David G. Lister, administrative director, Common, Suite 1717, 435 N. Michigan Ave., Chicago, Ill. 60611.

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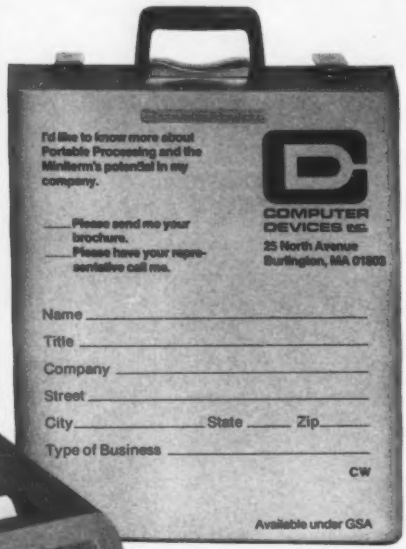

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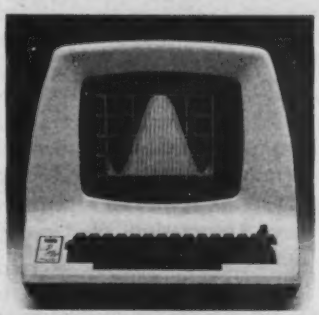

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At a Low-Range Price

PDP-11V03 Gives Mid-Range Performance

By Hillel Segal

Digital Equipment Corp.'s smallest PDP-11 processor is priced at the bottom of the $15,000 to $25,000 range of systems tested, but turned in a mid-range performance in the six benchmark categories and received favorable comments from most users.

The PDP-11V03 ran seventh in the scientific/engineering real-life application test within a field of 12 systems. In other tests, it ran the gamut of possible results from excellent to poor. But users surveyed during the benchmarking process were generally satisfied with performance and rated system reliability and DEC's field service highly.

ACU User Comparisons

The benchmark tests, conducted for the Association of Computer Users (ACU) by an independent consulting organization, measure system performance by comparing run-times for a series of standard programs written in Basic. The set of benchmark programs includes three applications tests, a CPU test, I/O test and an editor test that measures the convenience and speed of the system editor supplied with the computer.

In the case of the PDP-11V03, the program editor tested during the benchmark process proved to be quite cumbersome and turned in only a "fair" performance in editing the standard test used for the test. But a modern CRT-oriented editor has since replaced the printing terminal style editor in both the RT-11 and CTS-300 operating systems and could be explaced the printing terminal-style ediing to a DEC spokesman.

Marketing Distinction

It is interesting to note that although the hardware is essentially the same, DEC markets the computer under different names depending on the operating system and languages shipped with the system. The PDP-11V03 runs under the RT-11 operating system, with Basic, APL and Fortran as the primary languages. The DEC Datasystem 323 runs under the multiuser CTS-300 operating system with the Dibold language, a DEC business applications development language.

The significance of this marketing distinction, in practice, is that scientific and technical users prefer the single-user operating system with the more common scientific languages. The users in the technical applications often buy directly from DEC, provide their own special software in the standard languages and rely on DEC only for repair service.

But in commercial applications, the overwhelming tendency is to choose the multiuser operating system and buy through an OEM who may supply most of the software. Again, DEC may give only hardware service to the end user, while providing the OEM with top-level programming guidance. DEC's Mike Gallup told us the company has about 600 OEMs.

This large number of suppliers of DEC equipment is a reflection of the enormous success DEC has had in the minicomputer field over the last 10 years. While once they were the challengers to the established giants, DEC now is a giant in its own right.

Unlike IBM, which has adopted what might be termed a "hold your hand" approach to customer support, DEC prefers to let the OEM provide the programming assistance — particularly for business users. However, beginning about a year ago, local retail outlets for DEC products were opened in a dozen major cities, so that direct manufacturer support is available in the largest metropolitan areas.

It might be said that DEC is still living down the "OEM-only" image with which it began. Now that it is a very large company, the bureaucracy has grown to rival that of IBM; some users may find this a problem when trying to get answers to questions which fall into the gray area between OEM and factory responsibility.

Those using the CTS-300 system in a multiuser environment found that the 56K-byte user memory supplied sometimes became restrictive in practice; for them DEC has come out with a new processor, the PDP-11/23, which has from 128K to 256K bytes of memory and is said by DEC to run two to three times as fast. The incremental cost is about $1,500, and present PDP-11V03s are upgradable to the new hardware.

The VT 100 CRT terminal received high marks from users surveyed. It features a selectable line length of 80 or 132 characters, allowing a "print image" of large forms on the screen.

The price of the system today, $16,650, includes the 11/03 processor, dual floppy drives (1M byte), VT 100 terminal, cabinet and RT-11 operating system, plus the Basic language license and a Decwriter III printing terminal.

Strongest Showing

The 11V03's strongest showing in the series of benchmark tests came in the I/O test, where it was rated "excellent," placing third within the field of 12. In this benchmark test, the system is commanded (in the Basic language) to store numbers on floppy disk and later retrieve them.

The test is run at four different settings, ranging from 500 to 3,000 numbers being written. The purpose of this is to measure the efficiency of the specific system's disk medium by providing a standard series of disk I/O tasks. The implication is that in applications tasks which require heavy use of the floppies during execution, the PDP-11V03 will have a speed advantage.

The disk drives, incidentally, support both the single density mode and double density with 512K bytes per disk.

Languages supplied with the RT-11 operating system and utilities are Basic, Fortran and APL, mentioned above; Focal, an on-line calculation language; and Macro, the DEC assembly language.

In our discussions with users of the PDP-11 series equipment, we found reliability of the hardware was one of their reasons for choosing DEC.

The DEC service organization also received high marks for responding the same day to calls and generally getting the system back in operation quickly.

But when it came to software problems, several users complained that they had become caught at times in the maze of a large corporate organizational structure.

For some users, the price tag and reputation for reliability will be reasons enough to consider the PDP-11V03.

But especially when considering a DEC system, the end user must evaluate the support to be provided by the OEM he selects, unless he already has a substantial programming capability.

Next week: a look at the Q1 Lite small computer.

Scorebox

System: DEC PDP-11V03
Current Price: $16,650

		Benchmark Results	
		Time	Ranking
C-1	Scientific/-Engineering Problem	14 Min 43 Sec	7th
C-3	Accounts Receivable	4 Min 14 Sec	5th

Other Benchmark Ranks*

	C-1	C-3
IBM 5110	8th	4th
Wang 2200VP	1st	3rd
Texas Instruments FS 990/10	**	2nd
Hewlett-Packard System 45	3rd	8th
DEC PDP-11V03	7th	5th
Q1 Lite Microcomputer System	To be covered in future issues	
Northern Telecom/-Sycor 405		
Datapoint 1170		
Randal 100		
Texas Instruments DS 990 Model 2		
Hewlett-Packard 250		

* Out of 12 systems tested in this series.

** Could not run due to memory limitations using TI's standard 990 Basic.

This week 'Computerworld' resumes publication of the highlights of benchmark tests conducted on popular small computer systems. The full reports were originally published by the Association of Computer Users, a 4,000-member nonprofit organization.

About the Author

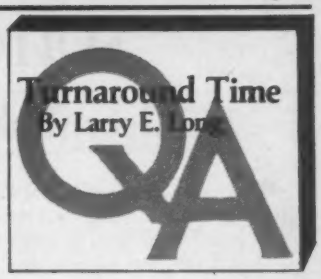
Hillel Segal is president of the Association of Computer Users (ACU), a nonprofit association with members all over the U.S., Canada and several foreign countries.

One of the association's key activities is the publication of its monthly "Benchmark Reports." ACU's Series No. 1 reports on systems priced less than $15,000. Series No. 2 covers the range from $15,000 to $25,000 and Series No. 3 tests systems priced between $25,000 and $50,000.

Series No. 2 includes benchmarks on the IBM 5110, Wang Laboratories, Inc. 2200VP, Texas Instruments, Inc. FS 990/10 and DS 990 Model 2, Hewlett-Packard Co. System 45 and 250, Datapoint Corp. 1170, Randal Data Systems, Inc. RDS-100, Digital Equipment Corp. PDP-11/03, Univac BC/7-610, Q1 Lite Microcomputer System and Northern Telecom/Sycor 405.

Full reports on these benchmark tests, as well as information about the other benchmark series, are available from ACU. The entire Series No. 2 costs members $150 (annual dues are $25). More information is available from the association at P.O. Box 9003, Boulder, Colo. 80301.

Budgets Tied to Scope of Services



Q Where can I get information that identifies guidelines for data processing annual expenses for manufacturing organizations? Years ago this used to be 1% of annual sales as an average, but I suspect this may have changed because of the more extensive manufacturing systems involvement that currently exists.

A Statistics on the DP budget as a percentage of annual sales are compiled and published regularly. The results of these surveys are interesting, but have little real value.

For any given company, the data needed to compute the DP budget as a percentage of annual sales is readily available. However, an in-depth look at the scope of services supported by the various DP budgets would surface disparities that render existing statistics meaningless.

For example, the DP budget may or may not encompass the following activities: data entry (often done at the source), hardware and/or personnel at remote locations in distributed data processing environments, computer-aided manufacturing (CAM), word processing and so on. Also, the level of sophistication is directly proportional to computing power and number of personnel, and therefore to the budget.

In order to provide useful guidelines for DP budget preparation, a budget survey must consider the variations in the scope of DP services. Because of your question and the need for these guidelines, planning has been initiated to conduct such a survey. I'll send you the results.

Q The 50 programmers and analysts where I work use 50 different approaches to design programs and systems. The basic objective is to get the job done, and nobody cares how you do it.

My former employer did not use a specific design methodology, but management encouraged us to use Warnier diagrams and to follow the basic guidelines of structured programming. Our approaches weren't very sophisticated, but the end result was far superior to anything here.

I've been here a month. Do you think I should suggest using the techniques that I used before?

A You have a golden opportunity to be a hero, but don't blow it by coming on as a know-it-all after only one month on the job.

Since you are not required to follow any standard procedures or documentation practices, inform your immediate supervisor that you would like to use the approaches that proved effective in your previous job. Ask your supervisor to observe your work and provide feedback on the applicability of these techniques to the existing environment.

If your supervisor is favorably impressed, you might discuss the benefits derived from having all programmers and analysts use a few basic standard approaches and techniques. You may well be the catalyst for everything from improving system quality to raising morale.

Q I have been a private DP consultant with my own Internal Revenue Service (IRS) number and insurance for years. My problem arises when I work for private consultant houses.

Some companies will let me take out my own taxes and keep my own records. Others say that because of the IRS laws, they cannot use me as a private consultant and can only use me as an employee of their company, thereby taking my taxes out in advance. I'm sure these somewhat changeable rules between different consultant houses are as confusing to others as they are to me.

When checking with the local IRS, they are also vague as to what one company will do vs. another. Can you shed any light on this somewhat confusing issue of why one company will say I must be an employee during the time of the contract and another company says it doesn't matter?

A The IRS has a history of being vague, but this issue has nothing to do with the IRS.

These companies may have a contract that does not permit sub-contracting, but since they used the IRS as an excuse, I'm inclined to believe that they're just trying to get the best of both worlds – the nonpermanence of a consultant at the wages of an employee. I can't imagine what their rationale would be for asking you to become an employee if you were to receive the same gross wages as a consultant.

Have a question? Send it to Larry Long, Editorial Department, Computerworld, 375 Cochituate Road, Rt. 30, Framingham, Mass.01701.

Long is a professor at Lehigh University, a DP consultant and author.

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Cleveland	September 9
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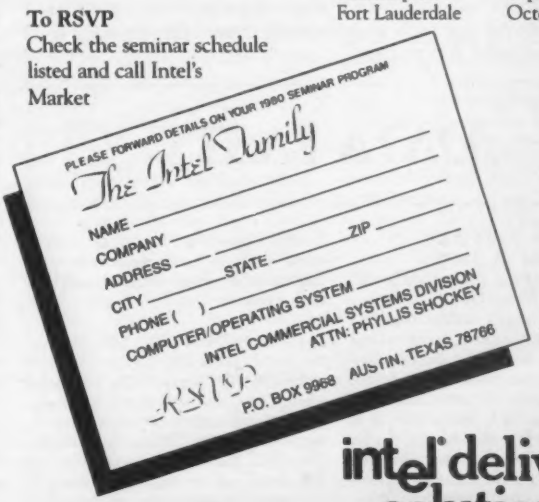

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EDITORIAL

Decentralizing CCH

Until recently, the Federal Bureau of Investigation has tried to establish a national data network for law enforcement agencies under its control in Washington, D.C.

That dream was born in the 1960s when, according to subsequent congressional testimony, the FBI waged a campaign against alleged social dissidents that involved illegal surveillance methods. Because of the FBI's reputation for violating civil liberties and the enormous potential that a national police network poses for supporting political repression, privacy activists have lobbied against various plans to implement FBI message switches.

A few weeks ago, the FBI said it no longer hopes to centralize its Computerized Criminal History (CCH) program, which provides the nation's local police departments with records on convicted criminals [CW, May 26]. The program is a major function of the FBI-administered National Crime Information Center (NCIC).

Now, the bureau wants to have state governments run separate criminal history data banks that would communicate with each other at the discretion of state officials. A police chief in Nevada could still access criminal data in Maine if the Maine government allows it, presumably on a case-by-case basis.

Under the new proposal, the NCIC would maintain an Interstate Indentification Index, known as "Triple-I," that state agencies could access to learn the locations of records on a given criminal suspect. To arrange a transfer of such records, the states would communicate over the National Law Enforcement Telecommunications System (Nlets), a network run by the states from Phoenix.

A number of law enforcement officials at various states have mixed feelings about the decentralization proposal [CW, June 9]. The FBI has presented and later torn up a number of plans for restructuring the NCIC during the past decade, leading one top police official to remark about this plan that "it sounds good; but I'll believe it when I see it."

However, one should be reminded that it takes top-calibre people to staff the centers that handle such critical personal information. As more and more states automate their criminal justice systems so that state agencies can provide law enforcement officers on the street with information they need to do their jobs — and so they can interface with other states quickly, effectively and even on-line — the need for top people in state law enforcement DP centers becomes even more important.

While centralized police data communications at the national level warrants improved procedures of review by Congress, decentralization should not proceed before the states demonstrate that their legislatures are also willing to make sure that the systems having such an important impact on the way we live are managed appropriately.

'Watch closely, folks — I will now proceed to slice myself into three pieces right before your very eyes!'

DATA PAST

Five Years Ago
June 18, 1975

NASHUA, N.H. — A court order obtained by the New Hampshire Attorney General's Office halted the peddling of consumer credit files by a local credit bureau here. The bureau had sent area residents letters offering "sole possession of your complete credit file before it becomes part of a large computerized data bank." In its court petition, the Attorney General's Office alleged that the Credit Bureau of Nashua, Inc. and its president, Wesley C. Pike, were threatening to sell the credit files to a consumer reporting agency and this action would be a violation of the New Hampshire Fair Credit Reporting Act. The petition asked that the credit bureau be permanently enjoined from completing such a sale.

Eight Years Ago
June 21, 1972

MAYNARD, Mass. — Digital Equipment Corp. announced a programmable communications front-end processor for use with IBM 360s and 370s. The DEC 11D23 was said to be the first front end to require no polling by the central system, relying instead on interrupt techniques used with conventional peripherals. The system was based on the PDP-11/20 minicomputer.

LETTERS

Virtual Cobols

Congratulations to Alan Taylor on his very perceptive report of June 2! Virtual Cobols will become more important as the industry moves toward minis and microprocessors. He also correctly emphasized the importance of compatibility and downloadability. I would add the following points in support of his theme:

1) The introduction and use of 32-bit u-processors will not eliminate the requirement for virtual Cobols but will increase the requirement. Because of the relatively low cost of the processor to memory units, it will become vastly more economical to distribute processors with small cache-like memory than to give each processor an entire intact memory unit. Virtual languages are more efficient than virtual supervisors, because the compiler has more context available and can reduce the working-set size of the application (so less paging is required).

2) Virtual Cobol (and probably most higher level languages) does not require excessive amounts of internal support code above that required by a nonpaged implementation. The internal design is more complicated and requires extra attention. Today, the industry understands the construction of nonvirtual langauges and is therefore inclined to go with the "safe" bet.

As the industry becomes more exposed to the benefits of virtual languages and more confident in its ability to deliver virtual languages, they will become routine on small machines.

Robert T. Lindsay Jr.
President
Advanced Software Products, Inc.
Delray Beach, Fla.

Need for Benchmarks

I was pleased to see the April 14 article by Hillel Segal on benchmarking computers. The information was illuminating and confirmed my experiences in evaluating computers.

The message is clear: If you want to determine which computer offers the best price/performance ratio for your specific task, you should run a benchmark which simulates as closely as possible the specific tasks that the computer is expected to perform. For example, some computers are excellent for CPU-intensive tasks but inadequate for I/O-intensive tasks, and vice versa. The benchmark results might surprise you!

If benchmarking is so important, then why isn't it done more frequently? First, buyers often prefer the easy way out and rely on the representation and reputation of the vendors. Second, a benchmark requires software programs to be written and tests to be conducted on a number of computers. This is time-consuming and can be costly.

Therefore, as a rule of thumb, if your proposed computer expenditure is less than about $50,000, a benchmark program might not be economical. However, if the proposed expenditure is larger, then a benchmark program should be considered.

If you don't have the in-house capability to do it, then retain a consulting firm that does. An investment in a benchmark will give you the knowledge and comfort that you have selected the best computer for your specific needs, and the more expensive the hardware configuration, the more important this knowledge becomes.

Victor J. Krasan
Manager
Data Management Systems
Peat, Marwick, Mitchell & Co.
New York, N.Y.

Computerworld welcomes comments from its readers. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

HUMAN CONNECTION/Jack Stone

New Bell Facility 'A Programmer's Paradise'

Last fall I wrote about the pending move of the Eastern Region Headquarters of AT&T Long Lines — which houses its Washington, D.C., data center — to Oakton, Va., a nearby suburb. ["Employees Get Top Priority in Bell Relocation," CW, Sept. 10]. The move was a mammoth one, even when measured in Bell System terms. An entire Data Services division had to be relocated — an IBM-3032/3033 complex and nearly 400 programmer/analysts and support personnel — and it was mandatory that the move be accomplished with essentially zero impact upon the thousands of internal users who access the system from locations all over the country.

When I learned that the move was successfully completed this month, I arranged a follow-up meeting at Oakton with the same people I interviewed before: John Manton, head of the division, and Dick Davis, project manager for the move.

Needless to say, the DP facility is incredible.

In-Depth Planning

Manton felt that much of the success could be attributed to the in-depth planning process. "Dick carried around a master control book which included a detail task schedule for all events in the relocation. He used an automated system to generate the schedule so he could quickly replan when equipment vendors or building contractors reported delays or when we decided to modify the facilities or services. He also employed a computer-based floor plan generator — a Bell System-developed software package — which gave us the flexibility to make up-to-the-minute changes in the floor layout.

And Dick met regularly with all the key managers involved with the move to ensure an unrestricted flow of communications from the project office. He found that personal contacts, in addition to formal memos, were very important; they helped to answer questions fast which, in turn, helped maintain the confidence that we could handle the move efficiently."

Davis went on to discuss internal communications. "It was not only important that the managers and supervisors be kept informed, but all personnel as well. Management handled this responsibility during its regular staff meetings, and the project office prepared a special newsletter which was issued about every six weeks."

Any Surprises?

I asked them if they had any surprises, any major deviations from the plan. Manton noted, "Well, I would say the most significant one was the growth in demand for processing power that greatly exceeded our forecast. We originally figured that an upgrade to a dual 3033 configuration as part of the move would handle our needs nicely, but we found that we needed an extra mainframe. So we installed a 3032 as well.

"Currently, the 3032 and one 3033 are handling our on-line users; the second 3033 is used for batch jobs and TSO [Time-Sharing Option] for our programmers. When we are satisfied that all the mainframes are checked out, we will tie them together."

Davis added, "There was no problem in installing the third mainframe, because we have space in the machine area for five of them. In fact, one of the major reasons for the move was space; we literally ran out of it in the old location and couldn't even install another disk drive there if we had to."

Then Manton commented about their new programmer support facilities. "In addition to the turnaround time improvements for development jobs, we also augmented our hard-copy dial-up TSO terminals with a large number of direct-wired TSO display devices. These provide our programmers with full-screen edit capabilities. At the same time, we installed special outside lines for the dial-ups so our people would not have to use their regular telephone services."

Davis concluded by saying, "In many respects, our new facility is a programmer's paradise. We're working with top-of-the-line machinery, the applications are interesting and diverse, it's quiet and there's ample room and workspace. I've felt for a long time that if an organization can provide a reasonable set of programming tools and support services — those within current technology — the professional programmers will respond and turn out high-quality systems in relatively short periods of time. This is one of the best ways to increase programmer productivity and this is what we have at Oakton."

READER COMMENTARY/John K. Taber

Federal DP Crime Legislation Not Necessary

I had hoped that if I maintained silence, the controversy occasioned by my remarks before the Senate Judiciary Committee on the computer crime bill (S. 240) would fade. But since it has not, I must answer my critics.

First, some background about competence to address the issue of computer crime: My experience with the computer security literature is by now extensive. I have read it critically, then also examined the sources, which most computer crime authors don't bother to do. It is dismaying to see how often one writer will crib a computer crime horror story from another without verifying the source. Once in print, the author is apotheosized into an "expert," and his computer crime story becomes an infallible source for the next author, who in turn becomes an expert upon publication.

What is it about the computer that causes otherwise sensible men to lose all critical judgement?

One early computer security expert admitted to me that his source for several "crimes" was rumor. On the basis of one book, he was considered an expert, though he did not consider himself an expert and was under pressure to enter the computer security business. *Computerworld* readers will be interested to know that he decided not to, because, and I quote, "I questioned the ethics of scaring people." He has my respect.

The major source, directly or indirectly, of all computer crime is Donn Parker's study of SRI International. I have personally examined many of his cases. Lindsay L. Baird was correct in minimizing Parker's study, the source of which is mainly newspaper stories, inaccurate and replete with biases, and otherwise undocumented [Reader Commentary, CW, May 26]. For example, a number of cases are no more than one-line horror stories from the press releases of computer security firms that made their way into the papers. In other words, junk mail masquerading as news.

Parker has tried to investigate "reported" cases (even the junk mail constitutes "reported" cases in SRI terminology), and what accurate knowledge we have is the result of his efforts. But progress is very slow, and to date very few cases have been really verified.

'Cases of genuine computer crime are extremely rare. The majority of real cases claimed as "computer crimes" involve purely manual manipulation of input forms that eventually wind up as a computer record . . . The crimes require a knowledge of office procedures, but no knowledge of computer technology.'

Extremely Rare

Cases of genuine computer crime are extremely rare. The majority of real cases claimed as "computer crimes" involve purely manual manipulation of input forms that eventual wind up as a computer record. The Federal Bureau of Investigation calls such cases false record entries. The culprits are mostly clerks and managers, including auditors and accountants. The crimes required a knowledge of office procedures, but none of computer technology.

So far, I have encountered two genuine cases of computer crime in Parker's files, and I suspect a few more, but it is impossible to tell just how many until Parker verifies his cases and publishes them in full. There are certainly not hundreds. I feel that there are no more than a half dozen to a dozen.

Baird, in minimizing Parker's study, used FBI "statistics." However, the FBI does not maintain computer crime statistics, according to its own testimony on the computer crime bill, because it has no such category. The FBI's source for these "statistics" is precisely none other than Parker, whom the FBI is uncritically quoting, and if Parker's statistics are unacceptable, so then are the FBI's!

Parker's study has had very unfortunate effects. His interest is "sophisticated" computer crimes, but his collection is mostly false record entries. Thus, the real, noncomputer crimes in his collection have been confused with his speculative computer crimes, such as "time bombs," "Trojan horses," "salamis" and the like. These crimes have never occurred, so far as we know, except perhaps for two doubtful cases reported by Parker.

Such crimes are unfeasible. But unfortunately, computer scientists have spent much effort devising ingenious schemes to thwart the unfeasible crime, while the feasible noncomputer crime has been mislabeled a "computer crime," but otherwise ignored.

I believe that the noncomputer crime can be minimized by careful computer system design in ways that would not have been practical in manual record-keeping systems. For example, it is feasible for a bank manager to use the adjustment procedures to loot dormant accounts. Activity against dormant accounts is usually exception-reported to management, but if the manager himself is doing the looting, the report fails its purpose. But it seems possible to design the computer system to enforce authentication of out-of-season transactions and to enforce separation of responsibilities, perhaps by requiring independent verification before committing the transaction.

Instead, much effort has been expended keeping problem programs from scavenging I/O buffers for random data. The chances of accomplishing a theft of assets by this technique are pretty remote. Not that such ingenious schemes are worthless. They have application for national defense where information itself, however randomly acquired, is valuable. But they are beside the point for the prevention of white-collar crime.

Embarrassed Businessmen

Several of my critics have apparently swallowed the notion of the embarrassed businessman. I can believe that businessmen use discretion, thoroughly within the law, in reporting cases. But I cannot believe that businessmen are so embarrassed they would helplessly wring their hands and weep, "Oh dear me, I've been robbed once again!"

I am cynical enough to believe that this notion is concocted by proponents of the bill to explain away the fact that

(Continued on Page 40)

Federal DP Crime Legislation Not Needed

(Continued from Page 39)

very few computer crimes can be found — they are practically nonexistent. Like Don Quixote rescuing Dulcinea, the authors of this bill will save the damsel businessman with a bill she never asked for.

Banks, for example, are required to report *all* crimes by federal regulation, and if they don't, that is a breakdown in the enforcement of banking regulations for which this bill is no remedy.

Wayne Douglass Bennett's argument [CW, April 17] is suppositious, not factual. Essentially, our disagreement is political, and takes the form of a jurisdictional argument. As I see it, the question is: shall the powers of the FBI be greatly expanded into areas where present jurisdictions are adequate? Also, shall we pass a law where all the evidence indicates that it is unnecessary in the hopes that it is a nice idea?

Bennett argues that a computer crime bill is necessary, and anyhow, if it isn't, the passage of the bill is just a harmless waste of time. I would like to see this attitude drummed out of Washington. Fewer laws, but of better quality, are what we need.

Bennett also misquoted me. There are more than 40 federal laws applicable to computer crime already, but I did not say that they cover all computer crime. They cover computer crime proper to the federal government. The other crimes are covered by state law, as they should be.

Now, in fairness to the bill, the subcommittee on Criminal Laws and Procedures extensively revised it in response to the criticisms Sen. Abraham Ribicoff's (D-Conn.) original bill provoked. The subcommittee staff is very consciously trying to create a model bill for the states to use to counter the unfortunate bandwagon effect that the first blush of enthusiasm for Ribicoff's bill created in state legislatures.

Considering what the subcommittee started with, it did an excellent job. The vague crime, "unauthorized access," which could have meant anything in the courts, has been replaced with "intentional, unauthorized damage," a criminal concept which I think is better understood.

Furthermore, the definition of "computer," while still very broad, does exclude trivia like pocket calculators and thus narrows the meaning of the bill. Also, federal jurisdiction, while still broad, has been narrowed, and the bill provides guidelines for federal assumption of jurisdiction. The guidelines, however, are unenforceable.

Baird, in attacking my paper on Ribicoff's bill, was apparently unaware of these revisions.

In spite of these significant improvements and the conscientious efforts of the subcommittee staff, I do urge the defeat of the bill on the grounds that it is unnecessary and still raises troubling questions of proper jurisdiction.

The trouble is, most proponents of the computer crime bill have very little knowledge of computers. They have a vague idea of what computers do, but no detailed knowledge of how they do it.

I want to stress that there is nothing in anything I have said or written that is opposed to proper controls and procedures. Computer crime is indeed extremely rare and is not a significant social problem. That is not an attack on accountancy. Companies that fail to control their assets are remiss. Also, software people must provide security tools and responsible products.

But the standard must be the reasonably prudent man, not the hysteric scared witless by phantasmagorias. Let the watchword be Practical Pig, not Henny-Penny.

Taber is a programmer who lives in Santa Clara, Calif.

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LETTERS

'Slump' in Power

The word "slump," when used in discussions of supply and demand, usually refers to the demand side of the equation. Hence, the article "Slump Expected in California Electric Power: Lowest Levels in Decades" [CW, June 2] got off to a confusing start with its misleading title. Bumpy take-off notwithstanding, the message did get through on a matter of increasing national urgency — the declining ability of the electric energy industry to put in place power-generation resources to meet consumer demands.

Diablo Canyon nuclear power plant, by the way, is owned by Pacific Gas & Electric, not Southern California Edison, as was reported.

Peter Kushkowski
Hartford, Conn.

Portable Cobol

We at Microsoft were glad to see the attention given to portable Cobol by Alan Taylor in The Taylor Report [April 21], but we must take issue with Taylor's characterization of a recent entry in this market as "uniquely independent and portable."

Our Cobol-80 compiler for microcomputers, a mature and extensive implementation of the 1974 Ansi standard, has been licensed by vendors such as Advanced Micro Computers, AI Electronics, Altos, Billings, Cascade Data, Cromemco, Dynabyte, ICL, Intelligent Systems Corp., Ohio Scientific, Onyx Systems, Pertec, Rair Timesharing, R2E, Ricoh, Solid State Technology, Sord Computer Systems, TEI and Vector Graphic.

It is also available (in versions for CP/M, Isis-II, and Model II TRSDOS) to end users directly from Microsoft and third-party distributors.

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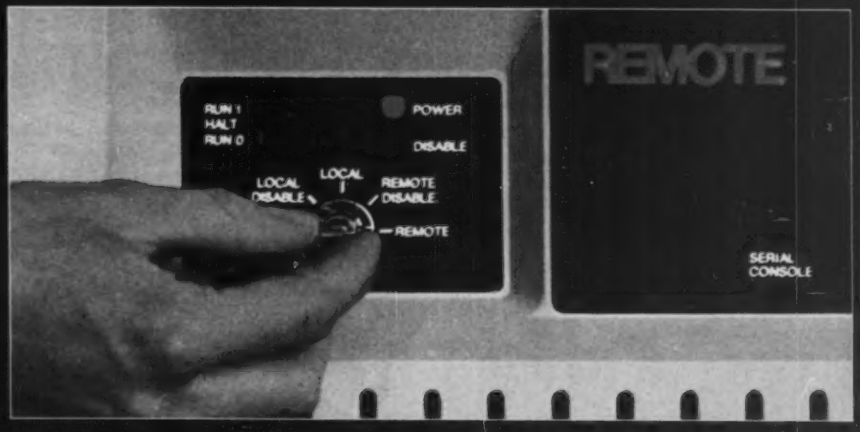

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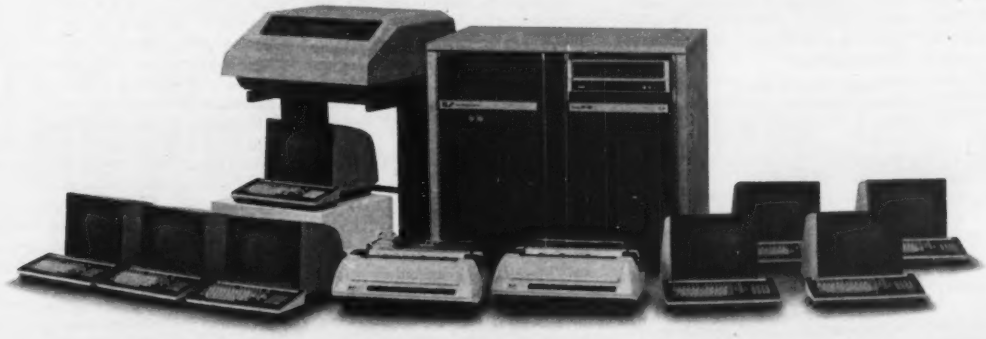

Four-Phase Systems
The Distributed Processing Company

THE TAYLOR REPORT/Alan Taylor

User Auditability Can Save Imperfect Systems

Universal Product Code (UPC) systems, which read lines on a package, look up a stored description and price and produce a bill, have been under attack from consumer advocates for years; and the UPC has been defended, meanwhile, by both the equipment manufacturers and users.

Now, Massachusetts Justice Francis Quirico, in holding against the equipment users in the state's top court, has added some new wrinkles to the argument. He has provided a concept of user auditability that may show how otherwise dangerous computer systems can be used to everyone's advantage.

The UPC argument came as a result of a many-pronged legal attack by a large supermarket chain against a State Attorney General's ruling that individual packages as well as the store's shelves had to be marked with the price. Much of the attack was purely legalistic — such as whether it was legally unfair if the regulations were not enforced against everyone at the same time. But two of the points were technical, and it is these with which we are concerned here:

- Shelf prices were sometimes different from the prices stored in the system's memory.
- The Consumer Protection Act system "will best be effectuated when consumers participate in its enforcement."

The first point is simply a recognition that the UPC system has flaws — something that has not been seriously denied for some years. The industry argument has always been that even with flaws, the UPC is worthwhile because of its various economies (one of which has been the claimed lack of need to price the items).

The second point, however, is a recognition of a *different* system as well as the UPC system. The other system is given priority when it comes to conflicting system needs.

The second system, the Consumer Protection Act system, is really just an auditing operation. At issue was whether the auditing for correct operation of the UPC was just to be possible, or whether it was to be easy. The store, Purity Supreme, claimed that is was proper and adequate for it to supply shelf prices and pencils so shoppers could write the shelf prices on the items. After checkout, customers could compare their records with the prices and descriptions shown on the printed record.

This method of auditing the process has clear problems. Not everyone will write down every price, some packages will be hard to mark clearly and, even if the two records disagree, it really *proves* nothing.

Quirico noted that item pricing would remove the obstacles to discovering when the UPC system was involved in overcharging. He gave approval for the state to require item pricing under the Consumer Protection Act.

In itself, the UPC situation is of considerable interest because the obvious dangers of computer error, or downright fraud, that show up in the UPC system hurt the image of DP. But beyond this, the recommended procedure shows how an inadequate system can be acceptably shored up.

Three Steps

The process of dealing with this situation shows three major steps:

- Demonstration of original system failure.
- Development of a user-initiated audit system.
- Curtailment of the original system to permit the user-initiated audit to operate adequately.

The steps follow closely, in concept, those taken in the case of computerized airline overbooking systems. Originally, overbooking was kept secret and then defended on percentages, but finally the users were given specific rights that they could, and in fact often do, insist on when an abuse has occured.

The overbooking system itself, with all the faults, is allowed to continue to operate, even though it is admitted that it can give erroneous results.

Similarly, under the court's ruling, the UPC system is being allowed to continue to operate, to price the packages correctly or incorrectly. But the barriers to fighting system errors are taken down.

Overbooking is only allowed now if the airlines give notice of its existence and explain the overbooked passengers' rights; in the same way, in Massachusetts the UPC system can lead to an overcharge as long as the customer gets a properly marked package. And then action is left to the user.

Certainly neither the UPC nor the overbooking case suggest that complete and perfect computer programs are being required. But the priorities are set. If a computer system is dangerous and incomplete, the user must be permitted to audit the system effectively if he so chooses.

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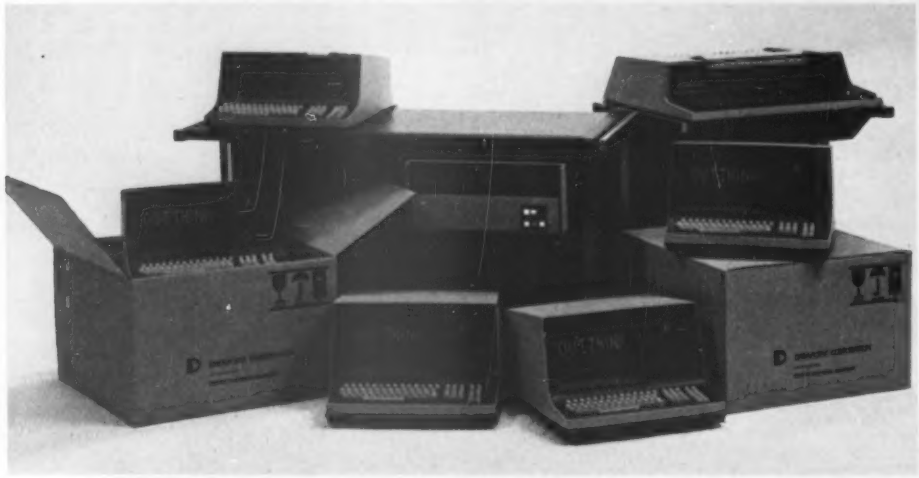

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DATAPOINT

Including IDCAMS

IBM Utilities Controlled by JCL Alone

By Warner Mach
Special to CW

Needing to create a PROC that would execute the IBM data-generator utility IEBDG, and needing to control the amount of output produced by simply altering a JCL parameter (rather than having to manipulate control cards) led us to a simple and useful trick for converting symbolic JCL parameters to control-card images.

This trick proved useful in controlling not only the standard IBM utilities, but the Vsam utility IDCAMS as well.

What we've done is use a program that punches PARM information that has been passed to it into an 80-byte card image.

Since the PARM information can be controlled using symbolic JCL, the control-card images can effectively be controlled using JCL alone. These control-card images can then be passed to subsequent steps which execute appropriate utilities or other programs.

This technique offers the following advantages over the usual method of control through both JCL and control card images:

• Agreement between the JCL and information on the control cards is assured at time of execution because the information originates at one point. Control cards do not, for example, call for allocation not supported by the data definition cards.

• For PROCs that are to be executed by non-DP-oriented end users, it is possible to provide control-card defaults and a simplified input format.

• The method allows more flexibility than placing preprepared and predefined control cards in a disk data set.

• There is an automatic tracking mechanism provided by the JCL log, showing all control parameters and substitutions.

• In the case of Vsam utility IDCAMS, Vsam data sets can be controlled through JCL alone and can be used in a manner similar to the way non-Vsam Temporary data sets are used.

Figure 1 shows a basic example

(Continued on Page 46)

'What we've done is use a program that punches PARM information that has been passed to it into an 80-byte card image. Since the PARM information can be controlled using symbolic JCL, the control-card images can effectively be controlled using JCL alone. These control-card images can than be passed to subsequent steps which execute appropriate utilities or other programs.'

On-Line Burroughs Systems Get File Maintenance, Report Writing

OKEMOS, Mich. – An on-line software package containing file maintenance and report generation modules that require no custom programming is available from Systems Research, Inc.

Both modules are known as SRI/Express and may be used independently or together on Burroughs Corp. B2000, B3000 and B4000 mainframes with MCPV 5.6 operating systems or greater.

The File Maintenance system module allows conversion from batch to on-line file maintenance without programming or altering data files and links new and existing data files to CRT terminals immediately, Systems Research said.

The Reporter module was designed to be used by analysts or end users to generate reports in one step, without programming, the company said, adding that ad hoc and continuing reports can be generated via English-like language commands.

The Reporter reads as many as three input files, sorts on multiple keys and extracts data to build new files, the vendor claimed.

SRI/Express modules operate under several communications controllers including Burroughs Single-Line or Multi-Line Control, B774 or B874 data communications processors or SRI/DCS front-end processing systems, in networks with any Burroughs-compatible 80-char.-width CRT terminals, Systems Research said.

The File Maintenance module sells for $5,000 and the Reporter module for $6,000. Together they cost $10,000, Systems Research said from 2400 Science Parkway, Okemos, Mich. 48864.

DYL-260, IDMS Interfaced

ENCINO, Calif. – Dylakor Software Systems, Inc. has released an interface for Cullinane Corp.'s IDMS data base management system (DBMS) and is offering an updated version of its interface to IBM's IMS and DL/1 DBMS.

DYL-IDMS reportedly allows IDMS to interface with Dylakor's DYL-260 report writer and extended utility. The package is said to simplify and speed up retrieval of records from files.

DYL-IDMS follows the verb usage predominant in IDMS, Cobol and PL/I. Although DYL-IDMS' Cobol looks like standard Cobol, it is actually a shorthand version of the language. However, its similarity to Cobol makes it easier to learn, the vendor claimed.

Other DYL-IDMS features included up to 32 bytes that can be set aside for record name, area and referencing, and a precoded routine that will allow the user to issue an ABORT command if the status reference is unsatisfactory.

Additional features include a copy code that is said to make it easier to accomplish FIND, OBTAIN, ACCEPT, IF, GET, READY, BIND and FINISH functions; an IDMS communications block; and data names for status values and self-documentation.

DYL-IDMS can currently be used only in an OS environment; however, a DOS version is expected to be released this fall. The interface costs $60.25/mo on a three-year lease.

Enhanced Interface

Dylakor's updated version of the DYL-IMS/-DL/1 interface, called Release 2.0, is now available in retrieval only (RO) and full function (FF) versions. The major enhancement is an ability to access multiple program blocks pointing to one data base, the vendor said.

Also added in Release 2.0 were the ability to represent a different access path to the data base record without a root key; the ability for a user to maintain two or more independent positions in one data base without reissuing a GET UNIQUE call; and DOS multiple-partition support.

The enhancement is available to Dylakor DYL-IMS/DL/1 users at no charge as part of the lease or purchase price. The DYL-IMS/DL/1 interface in the RO format costs $60.25/mo on a three-year lease. The FF version costs $83/mo, the vendor said from 16255 Ventura Blvd., Encino, Calif. 91436.

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Program Controls IBM, Vsam Utilities Using JCL

(Continued from Page 45)

of the use of our PARMA program in conjunction with the IEHLIST utility. PARMA accepts PARM information and punches the information to an 80-byte card image out of the OUTPUT DD card.

In this case, IEHLIST is being used to provide Vtoc listings. The parameters being controlled are HOW (type of printed listing) and WHO (volume serial label of disk pack). It should be noted that WHO controls both the DD card allocation and the information passed in the control card.

If multiple control cards are to be passed to a utility, it can be done easily through several invocations of PARMA and the use of a MOD data set.

Most utilities can be controlled under most circumstances using the PARMA program, which was written in assembler. The technique may also be useful for installation-written programs that are controlled by parameter cards, especially where only a restricted subset of all possible parameters are generally used and in those cases where parameter card input is arbitrary or rigid.

Note that in designing the symbolic parameters, the intent in some cases may be paramenters that are actually to be overridden, while in other cases, they are to serve simply as convenient character strings. By taking advantage of the JCL single-quotes facility, almost any combination is possible. For example:

- AB='HEADER,PAY.' '
- If no parameter (NULL) is an option, it may be necessary to code the comma in with the parameter: HOW='DUMP,'.

Continuation Character

One problem that appears for some utilities is the need to put a continuation character in column 72 for continued cards. If the parameters to be passed are of constant length, the continuation character can be forced to column 72 by using symbolic parameters that represent blank spaces (for example, SP8='bbbbbbbb') and through the use of actual blanks.

However, there is still the problem of symbolic parameters that are of variable length and are used in conjunction with a continuation character. This problem calls for a slightly more complicated program:

1. If the total PARM is less than 72 bytes and the ending character is not a comma, then one card image is written. This card image is the same character string passed by PARM.
2. If the total PARM is less than 72 bytes and the ending character is a comma, then one card image is written and a continuation character is put in column 72.
3. If the total PARM is 72 bytes or greater, then a search backward is made to the first comma or blank before column 72; the card image is blanked out from this delimiter on, and a continuation character is placed in column 72. A second card is

```
          The Procedure:
//LISTER PROC HOW=FORMAT,WHO=WORK01
//S0 EXEC PGM=PARMA,PARM='LISTVTOC &HOW,VOL=SYSDA=&WHO'
//OUTPUT DD DSN=&&TMPPARM,DISP=(NEW,PASS),UNIT=SYSDA,SPACE=(TRK,(1))
//S1 EXEC PGM=IEHLIST
//SYSPRINT DD SYSOUT=A
//DD1  DD UNIT=SYSDA,DISP=SHR,VOL=SER=&WHO
//SYSIN DD DSN=&&TMPPARM,DISP=(OLD,DELETE)



          The Run Deck:
//WMPARMA1 JOB (0100),'PARMA EXAMP1',CLASS=J
//SA EXEC LISTER,HOW=DUMP
//SB EXEC LISTER,HOW=DUMP,WHO=WORK03
//SC EXEC LISTER,WHO=WORK03

          Card-images passed with each invocation of PROC.
          One card-image passed in &&TMPPARM with each invocation.
LISTVTOC DUMP,VOL=SYSDA=WORK01
LISTVTOC DUMP,VOL=SYSDA=WORK03
LISTVTOC FORMAT,VOL=SYSDA=WORK03
```

Figure 1

```
          The Procedure:
//RENAME PROC LIB='TESTLIB',VOL=WORK01,OMEM=AA,NMEM=BB
//S0 EXEC PGM=PARMF,
// PARM='RENAME DSNAME=&LIB,MEMBER=&OMEM,NEWNAME=&NMEM,VOL=SYSDA=&VOL'
//OUTPUT DD DSN=&&TMPPARM,DISP=(NEW,PASS),UNIT=SYSDA,SPACE=(TRK,1)
//S1 EXEC PGM=IEHPROGM
//SYSPRINT DD SYSOUT=A
//DD1 DD UNIT=SYSDA,DISP=SHR,VOL=SER=&VOL
//SYSIN DD DSN=&&.MPPARM,DISP=(OLD,DELETE)



          The Run Deck:
//WMPARMF1 JOB (0100),'PARMF EXAMP1',CLASS=J
//SA EXEC RENAME,OMEM=PROGRAMA,NMEM=PROGRAMB,LIB='WORK.NEWLIB.SOURCE'

          Card images passed in &&TMPPARM with single invocation of
          RENAME PROC:
 RENAME DSNAME=WORK.NEWLIB.SOURCE,MEMBER=PROGRAMA,NEWNAME=PROGRAMB,     X
        VOL=SYSDA=WORK01
```

Figure 2

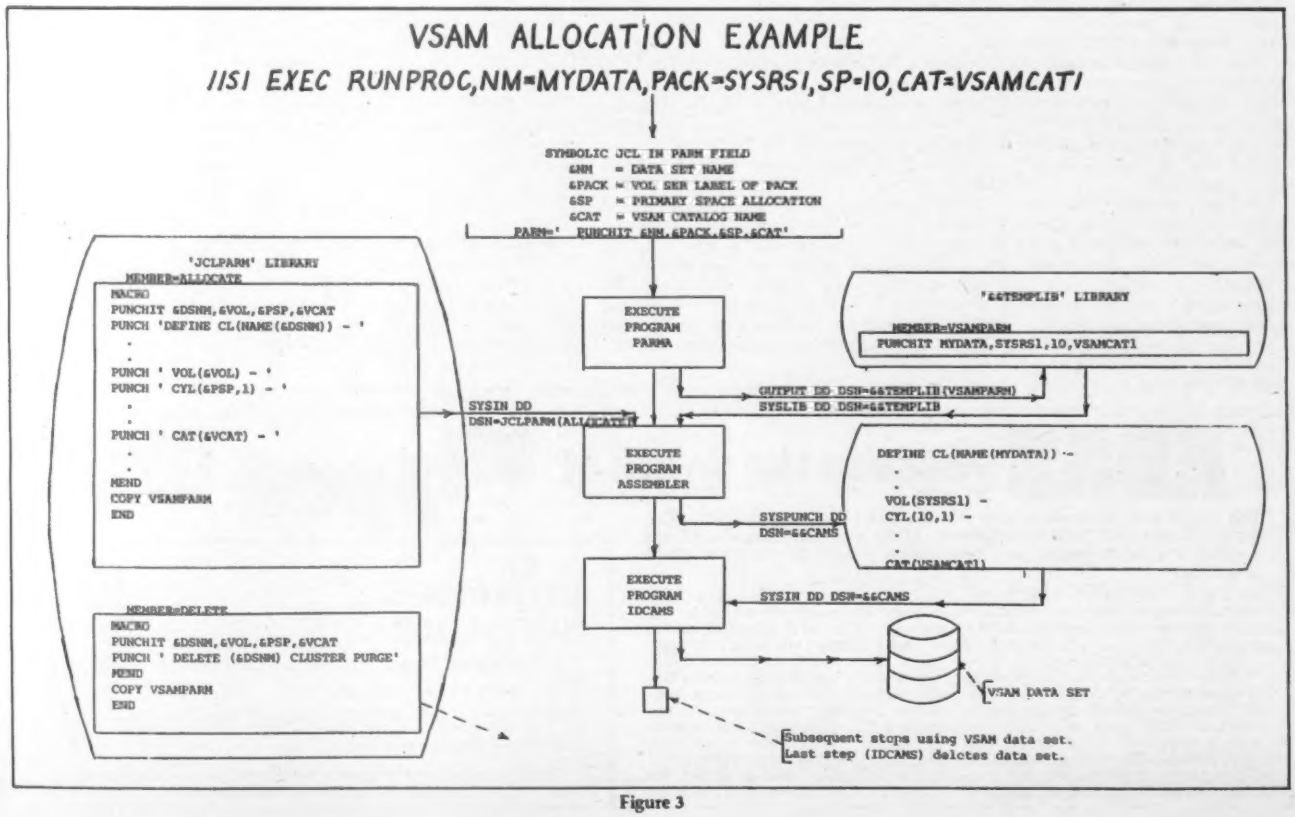

Figure 3

Without Requiring Manipulation of Control Cards

punched (starting in column 16), which contains the excess information. If this ending information ended in a comma, then a continuation character is put on the second card-image record.

Figure 2 shows the more sophisticated program PARMF (which incorporates the above specs) used in conjunction with utility IEHPROGM.

Program PARMA can be used with Vsam utility IDCAMS as well as the older IBM utilities. This allows the sort of JCL-controlled dynamic allocation and deallocation provided by non-Vsam Temporary data sets.

Three desirable features of Temporary data sets can be simulated:

- Allocation and deletion is controlled through JCL alone.
- The Vsam data set can be made to exist only for the duration of the run.
- By providing, through JCL, a unique name or unique prefix (possibly the ID of the person executing the PROC) to a Vsam data set name, it is possible to simultaneously execute the same PROC without having separate runs enqueue on the same Vsam data sets.

Figure 3 shows the basic flow using the assembler.

The control card punched out of PARMA is the only member of a temporary library (&&TEMPLIB). A second, permanent, library (JCLPARM) contains a member (ALLOCATE) for Vsam allocation and a member (DELETE) to delete the Vsam data set(s).

The members ALLOCATE and DELETE consist of source (in-stream) macro definitions followed by a COPY command. &&TEMPLIB is the SYSLIB DD library for the assembler, and the member copied in (by COPY) is the single member placed there by PARMA.

The card image copied in consists of a macro command (PUNCHIT in the example) followed by the required parameters (coming originally from the JCL). The macro command calls for execution of the source macro. The source macro causes the punching of Vsam control cards which are passed to IDCAMS, which is executed later.

The name of the macro command (PUNCHIT) remains the same for both allocation and deletion, but the source macro which gets executed is the one which is appropriate. The required member (ALLOCATE or DELETE) on the JCLPARM library is pointed to by the assembler SYSIN DD.

Mach is a systems programmer at Wayne County Intermediate School District in Wayne, Mich.

VAX-11/780s, PDP-11s Get Support Service

COLORADO SPRINGS, Colo. — Digital Equipment Corp. is offering a 24-hour, seven-day-a-week, dial-up software support service to its PDP-11 and VAX-11/780 systems customers.

Called the Telephone Support Center (TSC), the program will provide support for the VAX/VMS, RSTS/E, CTS/500, RSX-11M and RT-11 operating systems, the firm said.

TCS services are currently available for DEC users in the U.S. and Canada under warranty or subscribing to DEC's post-warranty Software Products Service.

DEC has been offering dial-up support for its minicomputer software. A spokesman said addition of the 24-hour service is intended to make the existing service more flexible.

DEC is headquartered in Maynard, Mass. 01754.

Package Tracks Multiple Tasks

BERKELEY, Calif. — An interactive project scheduling system that tracks multitask projects of up to 3,000 activities is available from Technical Economics, Inc.

Called Critical Path Method (CPM), the software runs on Digital Equipment Corp. Decsystem-10 and 20 and PDP-11 processors, as well as on Data General Corp., Perkin-Elmer Corp. and Prime Computer, Inc. equipment.

CPM can generate 12 types of reports, including schedules, a listing of activities on or behind schedule and a summary of activities to be performed during a given time period.

The package also produces a Precedence Network Report, a graphic diagram of the whole project that can be printed on a line printer or any 132-column remote terminal, the vendor noted.

Written in Fortran, CPM accepts either I-J or precedence notation and requires a minimum of 32K words of core memory and 3M bytes of disk space. It licenses for under $8,500, Technical Economics said from P.O. Box 7261, Berkeley, Calif. 94707.

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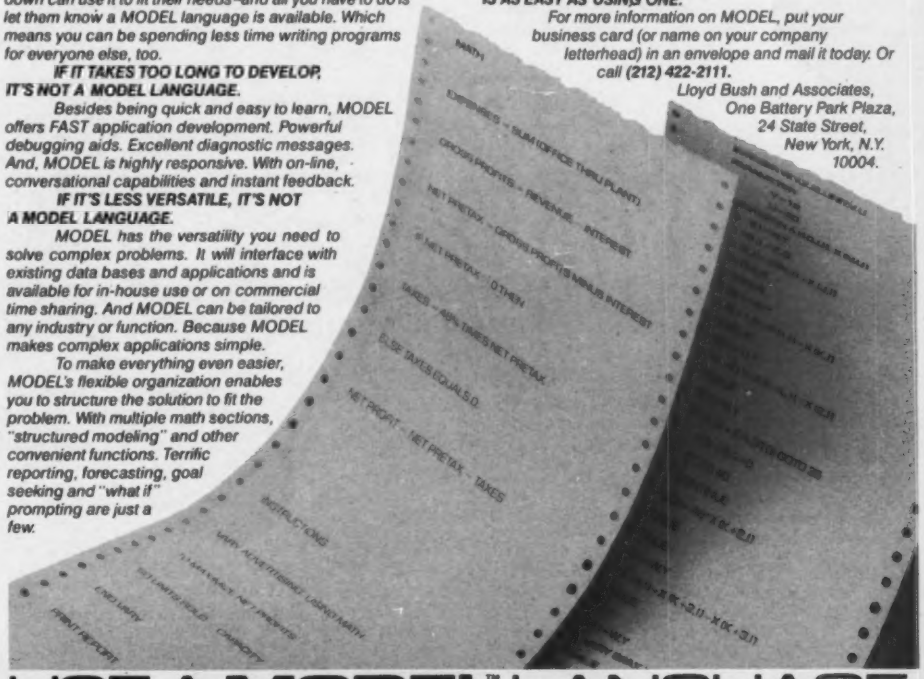

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Supports 3310, 3370 Drives

Sort Package Runs With 4300 CPUs

JERICHO, N.Y. — An enhanced version of Computer Associates, Inc.'s CA-Sort/DOS sort package offers support for IBM's 3310 and 3370/FBA disk drives that operate with the 4300 series processors.

Release 6.0 of CA-Sort supports both DASD models for all SORTIN, SORTOUT and SORTWK files processed by the sort package, the vendor stated.

Also added in this release was automatic in-core sorting, a capability that is said to eliminate the need for additional JCL and for users to specify parameters to perform this function.

In addition, Release 6.0 allows the SUM facility to be handled in Phase I of the sort to reduce sorting time and permits variable-length records to be processed with the OUTREC statement. With this latter capability, users no longer have to write special exit programs, the vendor claimed.

Another feature in Release 6.0 allows files to be output to the printer so formats can be checked.

CA-Sort/DOS Release 6.0 is available for a perpetual license fee of $3,900; month-to-month licenses cost $135 per month.

Computer Associates is at 125 Jericho Tnpk., Jericho, N.Y. 11753.

Apex Users Get Codasyl-Compliant DBMS

KANSAS CITY, Mo. — A Codasyl-compliant data base management system (DBMS) that supports hierarchical and network data structures through set relational data bases is available from United Computing Systems, Inc. to users of its Apex remote computing service.

A modular DBMS, Triad features separate processors for data definition, interactive inquiry and update, report writing, transaction processing and host language interface.

Data access is achieved either through user-written programs in Fortran or Cobol or the interactive query/report language, the vendor said.

Triad's interactive query language is said to automatically determine access paths in data bases of any complexity and to permit user-defined variables as well as calculations of totals and subtotals.

Report Definition

With the system's report definition processor, users can compose reports which may consist of headings, footings, total and detail lines and which may be controlled by one or more break fields for totals and subtotals. Designed primarily for bulk data base loading and updating, Triad's transaction processor accepts input data in a format predefined by the user and performs user-directed actions. A transaction definition language communicates data definition and action directives to the transaction processor.

This module can also be used to unload all or part of a data base into a sequential flat file for off-loading, backup and interface to other application systems, according to the vendor.

An interactive data manipulation processor is said to allow interactive execution of host language calls, a capability that can be used for testing program designs, validating the data base, repairing bad data and making one-of-a-kind updates and retrievals.

Costs for the use of the Triad DBMS are based on service unit pricing of the Apex remote computing service, the vendor explained from 2525 Washington, Kansas City, Mo. 64108.

Transaction Processor Fits Prime 150s Through 750s

PHOENIX — A transaction processor for Prime Computer, Inc.'s models 150 through 750 CPUs was introduced by Database Systems Corp.

Known as Transact, the package consists of several modules: a Transact executive, run system, forms library and data base library. It also includes a data base language and data manipulation system for generating applications.

The library can be accessed using subroutines written in Cobol, Fortran or PL/I, the vendor said. Transact's data base language supports linked file relationships including single file, hierarchical and network file structures.

With Transact, users can construct menus and screens that can be linked to a file structure for on-line query, updating or adding new information, according to the vendor. For each transaction, the system performs data validation of fields including range check, table look-up or extraction and modulus tests.

Transactions can be journalized to disk or tape with full restart and recovery supported, the vendor claimed. The transaction processor supports all Prime file types including Midas, Binary and Ascii as well as Database Systems' Power and Power/Plus dictionaries, which are licensed directly from Prime.

Transact licenses for $10,000 from Database Systems at Suite 710, 5251 N. 16th St., Phoenix, Ariz. 85016.

Packages Geared To 4300s

RACINE, Wisc. — Financial applications packages for IBM's 4300 series of CPUs are now being offered by Information Management Software Specialists, Inc. (IMSS).

Targeted for DOS users, the applications available include general ledger, payroll and accounts payable. Due out in the fourth quarter will be customer order processing and accounts receivable packages, IMSS said.

Available for one-time paid up licenses or 24-mo purchase lease terms, the packages range in price from $9,900 to $27,500 from the vendor at 3904 Wright Ave., Racine, Wisc. 53405.

General Ledger Fits System/34

BEDFORD, N.H. — A general ledger and financial reporting package for IBM's System/34 CPU is available from Informatics, Inc.'s Minicomputer Applications Products Division here.

The package is said to provide complete financial reporting including comparisons with historical and budgeted data, cost allocation, product planning and forecasting.

Designed specifically for minicomputers in a distributed environment, the package costs $17,500 from the vendor at 21031 Ventura Blvd, Woodland Hills, Calif. 91364.

Security System Supports CICS

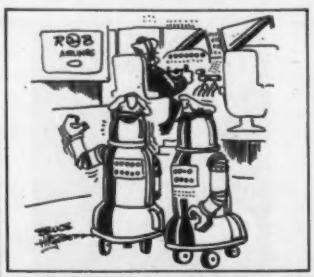
LOS ALTOS HILLS, Calif. — The Cambridge Systems Group (CSG) enhanced its software security system, ACF2, to support level 1.4 of IBM's CICS.

According to CSG, this enhancement offers the capability to validate users at CICS sign-on and limit a user's authority to initiate the execution of CICS transactions from an originating terminal.

The memory requirement for CICS support is 17K bytes plus 604 bytes per user, the vendor noted.

Existing ACF2 users will receive the CICS support feature at no additional cost. However, recently added features such as support for IBM's IMS and for Applied Data Research Corp.'s Roscoe will result in a price increase for ACF2 in the third quarter, CSG said.

ACF2 currently licenses for $21,000 per CPU from CSG at 24275 Elise, Los Altos Hills, Calif. 94022.



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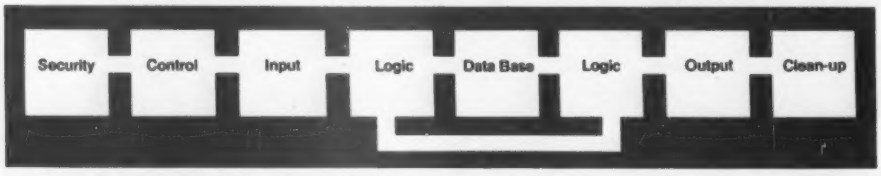
Break It Down to See How It Stacks Up



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"Here are four reasons why we switched to NCR," says Dale A. Dooley of the Iowa Transfer System.

DOOLEY:
The Iowa Transfer System is the first electronic funds transfer system to operate statewide. Over 85 percent of the commercial banks in Iowa are supporting members. We recently installed an NCR 8450 as the central element — the switch — in our network.

NCR's SCHULTE:
It's the element that makes the remote connections, so that every terminal has access to every bank on the network. All across the state of Iowa.

DOOLEY:
Our first reason for going to NCR is monetary. With NCR, our costs are substantially lower than under our previous arrangement.

Dale A. Dooley (left) is executive director of Iowa Transfer System, Inc., in Des Moines. Jim Schulte is NCR district manager.

NCR's SCHULTE:
And at least a bit lower than the other alternatives you explored.

DOOLEY:
Then there is the support we received from NCR and from you, Jim. And NCR's known commitment to EFT.

NCR's SCHULTE:
NCR representatives are specialized. All the people in my group work exclusively with financial institutions. So we are in tune with current financial trends. Other NCR representatives have parallel specialties so they can be more responsive to the problems peculiar to their industries. It's a concept that is working well for us.

DOOLEY:
The third reason is software. Only NCR could provide the switch software we needed when we had to have it.

NCR's SCHULTE:
Not only did we meet the deadline, but the transition to our system was very smooth.

DOOLEY:
Finally, our decision was influenced by the dependable performance of the other NCR systems within the network. And we have had the same experience with this system. Our uptime level has been very high — a critical consideration when you're talking about a network switch.

In the NCR office nearest you, there is an account manager like Jim Schulte who specializes in your industry and knows NCR systems. Learn how an NCR system can help you. Phone him at the local office. Or write to EDP Systems. NCR Corporation, Box 606, Dayton, Ohio 45401.

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DBMS Aids in Medical Equipment Fault Search

PLYMOUTH MEETING, Pa. — When medical equipment breaks down, the results can be more than frustrating — they can be fatal.

That's why the Emergency Care Research Institute (ECRI) here tests some 6,000 types of medical devices, reports on inferior products and warns hospitals of the dangers of improper use of others.

Since it started making equipment studies back in 1965, the firm has accumulated massive amounts of information. By 1979, ECRI had outgrown its five-year-old Hewlett-Packard Co. CPU with an Image 1000 data base management system (DBMS) and had begun to consider alternatives.

Elliot Sloane, DP manager for ECRI, was charged with evaluating minicomputers. IBM was not even considered until the 4300 announcement. The price performance advantages of the 4331 over any minicomputer motivated ECRI to place an early order, he said.

In October 1979, ECRI was told they would have a 4331 by December. The next step for Sloane and the evaluation team was the selection of a DBMS.

"It was not a question of whether we needed a DBMS; it was a question of which DBMS," Sloane explained. "We knew we needed it because of our experience with Image 1000. ECRI was already data base-oriented."

ECRI contacted various DBMS vendors to determine which systems would run on a 4331 with a CMS operating system and 3310 disk drives. The finalists included Intel Corp.'s System 2000/80 DBMS, Information Builders, Inc.'s Focus, Cullinane Corp.'s IDMS, Cincom Systems, Inc.'s Total and IBM's Query By Example (QBE).

"We settled on Intel's System 2000/80 because with it we could have more productivity sooner with less training and fewer personnel. Additionally, we were eager to get involved with a vendor who would work with us," Sloane said.

In November 1979, ECRI signed a contract with Intel for the System 2000/80. That December, ECRI's 4331 was delivered. By January, the DBMS was installed and Intel's Integrated Data Dictionary (IDD) was scheduled to be installed in March.

The DBMS now runs on the 4331 with IBM's fixed block architecture.

In the rush to acquire and install the new hardware and software, ECRI had to quickly get its applications planning in order. To support its activities, five application areas were identified.

- A medical device registry to track the department name, contact and equipment for hospitals wanting equipment matched against recalls, defects, injuries and safety problems.
- An on-line interactive parts inventory control system to support ECRI's service activities and track stock stored in 10 regional centers.
- A plant preventive maintenance equipment schedule application to track generators, boilers, air conditioners and other maintenance equipment.
- An effort accounting application to include general accounting information such as accounts receivable and payable, general ledger, cost center analysis and invoicing.
- A promotion and subscription control application to assist in tracking subscribers of ECRI's *Health Devices* and *Health Devices Alerts* publications, ECRI said.

ECRI is also considering the System 2000/80 for library and reference support for ECRI publications, including a buyer's guide to assist medical purchasers in choosing equipment. That information is now stored in 25 four-drawer file cabinets, ECRI said.

St. Louis Sewer District Acquires Financial Tool

ST. LOUIS — With this city and some 90 surrounding municipalities to serve, the Metropolitan St. Louis Sewer District (MSD) could not afford to use a substandard business and financial control system, so it purchased Local Government Financial System (LGFS) by American Management Systems, Inc. (AMS).

LGFS is specifically tailored for local government applications and performs a complete integration of accounting and budget activities, according to Norbert Stevens, MSD's director of finance.

The system is also in compliance with the Government Accounting, Auditing and Financial Reporting (GAAFR) principles published by the Municipal Finance Officers Association. MSD must comply with those principles, Stevens said.

System Upgrade

Two years ago, the MSD governing body, a six-member board of trustees, agreed the district's business and financial control systems needed substantial upgrading.

The trustees commissioned an accounting firm to develop a conceptual design for improved accounting and related systems. "We took the design they submitted and went looking for the appropriate hardware and software," Stevens said.

At the core of their search was the need for financial and accounting control. The district had what Stevens called "some fairly ambitious objectives for our system" and wanted one that could handle utility billings and provide accurate financial data.

Before purchasing LGFS, MSD considered MSA Accounts Payable and MSA Accounts Receivable by MSA Corp., he said. They were rejected because they were not integrated, which made them more expensive. LGFS was also more streamlined than MSA and required less programming, the director said.

In-House Approach

An alternative that Stevens rejected was that of developing another in-house system.

Before the advent of LGFS, MSD was using a proprietary in-house system that Stevens described as "not very good." It could handle only one of the agency's 65 funds, while the other 64 were kept manually in books, he said.

In ruling out the in-house approach, Stevens said it would be too expensive and time-consuming, and he noted the advantages of going with LGFS.

"By getting what we considered for our purposes to be the best available product on the market, we were able to immediately put it to use and pass along its efficiencies to our customers," he said.

Installation was problem-free and well-supported by the vendor, who supplied 100 man-days of support, Stevens said. The contract was signed in January 1979, and the system was up and running by June.

System Benefits

Stevens was quick to note the system's benefits. "It has everything an accountant could ask for," he said. "It produces timely reports, is accurate and gets reports to management by the end of the month. It also leaves a good audit trail so we can trace transactions easily."

LGFS also has the ability to break grants down into funds so MSD can determine how much money is being spent in support of various parts of the grant, Stevens said.

The system is currently being run on an IBM 370/135 with 512K bytes of main memory under DOS/VS at the MSD computer center in St. Louis.

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Firm Slashes Energy Use 32% by Hiring 'Boss'

VALLEY FORGE, Pa. — Certainteed Corp., a fiberglass insulation manufacturer here, claims it reduced electrical and natural gas consumption by 32% and saved more than $40,000 during the first year it used Honeywell, Inc.'s computer-based Building Operation Services System (Boss).

Boss is a multiuser network service offering time-shared building operation and operating control for users in several states. It controls all heating, ventilating and mechanical equipment at Certainteed and is one of several operations monitored by the Honeywell branch office here.

Certainteed bought a building management system to conserve energy and cut costs, said R.H. Gotwalt, director of corporate facilities for the firm, adding that prior to Boss there was no organized management of energy control there.

The firm considered systems made by Power Management System and Johnson Control Co., but rejected them because they required 24-hour supervision. "We felt our maintenance staff was too small to man the system on a full-time basis," he said. "We just couldn't justify the additional manpower required."

Initial Savings

In the first 12 months of operation, the system reduced electrical consumption by 1,008,000 kilowatt hours, a $30,240 savings, and saved 2,808,000 cubic feet of natural gas, worth an estimated $10,109, he added.

After considering those savings, the firm's management recently authorized the system's expansion to its 207,000 sq ft technical center in nearby Blue Bell, Pa.

The Boss operator can electrically "walk" through Certainteed's headquarters by sitting at the keyboard of a Honeywell Delta 1000 desktop computer and pressing keys that summon a data display from any of the four buildings being monitored, according to Gotwalt.

The operator can check temperatures, start and stop equipment monitoring smoke alarms and watch for irregularities such as air conditioning malfunctions or equipment overheating.

If something goes wrong, the Boss operator receives an immediate warning and can shut down equipment and dispatch repair crews if necessary.

System Breach

The operator is similarly notified if the security system is breached. Heat sensors and door "contacts" go off if a door is opened.

The Boss system became fully operational at Certainteed in December 1978, and Gotwalt reported there were no problems with installation. The system has been problem-free since that time.

Besides controlling energy expenditures within the four buildings' open areas, Boss also operates 260 heat pumps used to regulate outside offices.

"With Boss, we can establish the parameters on how the system should work, based on our own operating schedule and Honeywell's experience with other buildings in the area," Gotwalt said, adding Honeywell takes over all operational and monitoring responsibilities after installation.

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The Networks Face Off

Confrontation looms between private and public international networks

By Philip A. Tenkhoff

The rapid proliferation of telecommunications networks on an international scale is having revolutionary effects not only on our concepts of information transfer but also on our culture and way of life.

Such networks have produced a society in which funds may be transferred halfway around the globe in seconds, airline seats from Tokyo to Honolulu can be instantly confirmed from Paris, and a manufacturer's inventory in Chicago can be immediately assessed from Hong Kong.

During the decade of the '70s, a multitude of private networks were designed and implemented. While these networks utilized transmission paths supplied by the telecommunications agencies of the world (common carriers), they relied upon hardware and software furnished by private corporate suppliers.

Two principal factors led network implementers to rely so heavily on the private sector:

- The common carriers could not provide the types of services demanded by contemporary information transfer needs (for example, volume-dependent charges for a wide variety of data transfer rates).
- The tariffs for the available services were too high compared with the costs of private networks.

During the latter part of the '70s, most of the major telecommunications administrations and common carriers of the world concluded that the unchecked proliferation of private networks represented a significant erosion of revenues. They reacted by instituting an aggressive program to implement public networks which would provide the services currently being provided by the private networks.

As we enter the '80s, several of these public networks have matured from "paper design" to operating entities. Thus, the stage has been set for a potentially major confrontation between common carriers and private network operators. Some of the principal issues involved are:

1) Will currently implemented private networks be permitted to continue to operate? To expand?

2) Will leased, dedicated line tariffs be increased to "discourage" private network operation?

3) Will the emerging public networks satisfactorily address the multitude of technical challenges of generalized network design and operation?

4) Will the telecommunications regulatory authorities of the world use the issues of privacy and transborder data flow to curtail or eliminate certain international data transfer?

5) Will private networks be permitted to interconnect with the new public networks?

This article examines some of the issues raised as telecommunications networks mature and enter the decade of the '80s — a period which will produce dramatic change as viewed by the user.

IN DEPTH

Historical Perspectives

The evolution of modern telecommunications services began with special-purpose networks. These networks were designed to perform a single function in a controlled environment. An early example of such a network

(Continued on In Depth/3)

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(Continued from In Depth/1)

was the American Airlines reservations system (Sabre), which operated in the early 1960s.

A significant step toward generalization began with the advent of the computer time-sharing networks of the mid-1960s; some initial examples were MIT's project MAC, General Electric Co.'s time-sharing network, Tymshare, Tymnet Inc.'s and Computer Sciences Corp.'s Infonet. These networks provided the end user with flexibility in terminal type and computer application.

The trend toward increased flexibility and greater sophistication continued in the late 1960s and early 1970s with the introduction of the Advanced Research Projects Agency Network (Arpanet). Arpanet extended the generalization of networks to include heterogeneous host computers, and it also pioneered a network architecture that used the concepts of information packets (packet switching).

From these beginnings, the latter part of the '70s produced a plethora of private networks that exploited technology and provided users with a multitude of alternatives to reliable, cost-effective communication.

While this revolution in telecommunications capability was being manifested, the world's telecommunications carriers appeared to more preoccupied with the expansion and improvement of classical services such as switched voice-grade circuits, Telex and leased, dedicated circuits. Innovation in data services was conspicuously absent in the '60s and early '70s.

However, in the mid-'70s, plans from the carriers began to emerge for new public services that would address user demands. Plans for networks such as Transpac, Datapac and Venus were discussed, for example, at the biennial International Conferences on Computer Communications in Stockholm (1974), Toronto (1976) and Kyoto (1978) [1,2,3].

Some of these networks have now progressed from design to operation. Perhaps the most notable are the Canadian Datapac and the French Transpac networks; Datapac began operation in 1976 and Transpac in 1979.

Value-Added Nets

In the U.S., the 1970s saw the emergence of the so-called value-added networks (VANs). These networks used transmission facilities provided by common carriers, such as AT&T, with technologically advanced hardware and software to provide a generalized class of data services. Examples of these networks are Telenet, which began operation as a recognized carrier in 1975, and Tymnet, which began operation as a recognized carrier in 1977.

AT&T has responded to these developments by its announced plans for the Advanced Communications Service (ACS) network. If and when implemented, ACS would provide a very flexible, broad range of data transmission services. However, ACS faces severe regulatory difficulties in addition to the large technical problems posed by such an "all-encompassing" network.

Also worthy of mention are two other major U.S. networks which have been proposed. First, Satellite Business Systems, Inc. (SBS) – a high-capacity data network being developed jointly by IBM, Comsat General and Aetna Life and Casualty – and second, Xerox Corp.'s Xerox Telecommunications Network (Xten).

With this background and brief historical perspective, let us focus attention on the issues that will play a major role in the future development of private and public networks. The succeeding three sections will address cost, policy and technical issues as they pertain to the evolution of data networks.

Cost Considerations

The vast majority of private networks that have been and are being implemented have one or both of two factors as their justification for existence: unavailability of the desired service and/or high cost of common-carrier services. For the purpose of illustrating the relative cost considerations, let us assume that the desired services are available from the common carriers as well as through development and implementation of a private network.

The issue, then, is one of cost. The user wishes to minimize his cost of

(Continued on In Depth/6)

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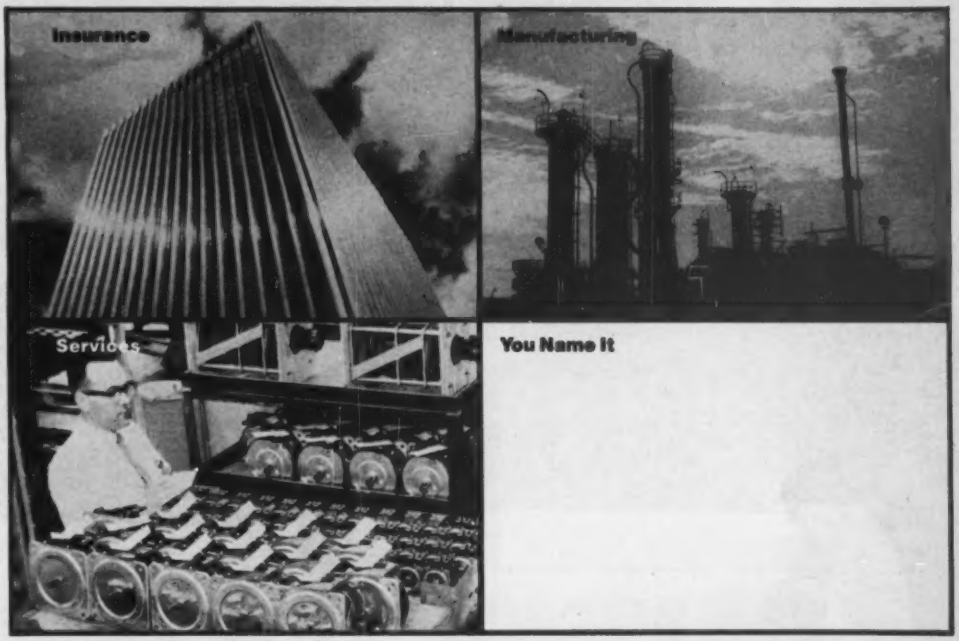

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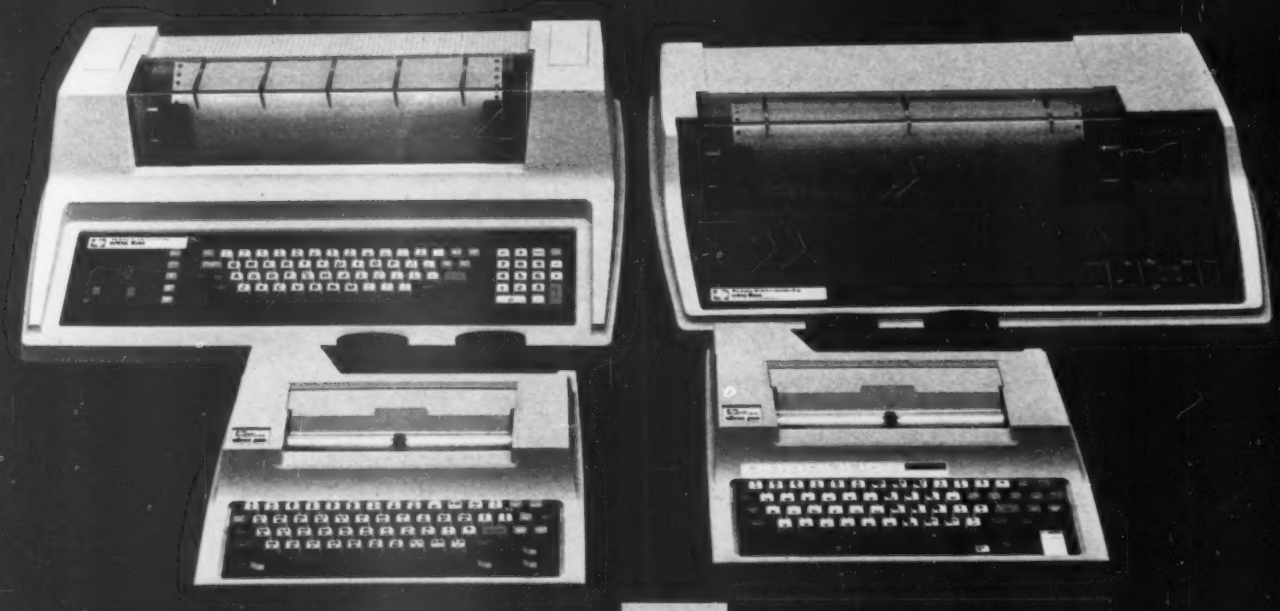

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IN DEPTH

(Continued from In Depth/3)

data communications services and the carrier wishes to maximize revenues from these services. In the case of the carrier, the desire for a high rate of return on data services is compounded by the fact that these lucrative services are needed to subsidize less cost-effective communications services such as providing voice telephones to sparsely popluated areas.

A simple example will help illustrate the potentially large magnitude of the difference between user costs of public and private network services in the U.S. and internationally.

Suppose XYZ company has a computer located in Dallas and has numerous keyboard-type terminals in two office buildings, one in New York and the other in Hong Kong. These terminals need to have on-line access to the computer center.

The following parameters are assumed:

Number of terminals per locations: 30
Average connect time: 1 hour/terminal/day
Terminal speed: 30 char./sec

One possible network solution is illustrated in Figure 1. The concentrators are assumed to be purchased at a price of $3,000 each; net monthly cost is $133 assuming five-year life and 12% cost of money.

Since the terminals are co-located with the concentrator, they are "hard-wired" into the concentrator and hence, do not use the switched network. (If the terminals use the switched network to access the concentrator, the analysis is essentially the same with the addition of low-speed modems and local toll charges, if any.)

Total base monthly cost from New York is then computed as follows:

One DDS circuit (N.Y./Dallas)	$917/mo
Two data synchronization units (DSU)	$563/mo
Two concentrators (Depreciation and interest)	$133/mo
TOTAL	$1,613/mo

If common-carrier services were to be used, each terminal would dial the Dallas center from New York. (This is less expensive than individual leased lines.) Total monthly cost is computed as follows:

(30 terminals) x (1 hour/day) x (21 day/mo) x ($24/hour) = $15,120

In this highly simplified example, the cost to the user for a private network is about one-tenth the cost of available common-carrier services from AT&T. (For the purpose of simplicity and illustration, such factors as maintenance, spares and personnel have been omitted. In actual practice, they must obviously be considered.)

A third approach would be to use Telenet; the monthly cost using Telenet for this example would be about $2,800.

International Applications

The above disparity in costs is also apparent for international applications. When, in this example, New York is replaced with Hong Kong, the resulting costs to the user are:

Monthly cost for private network	$ 17,424
Monthly cost for direct-dial access	$129,654

Hence, the cost to the user for the private network is about one-eighth of the common carrier cost.

To partially address this disparity, the international record carriers of the U.S. (RCA Corp., ITT and Western Union International), in conjunction with several of the world's postal, telephone and telegraph administrations (PTTs), have instituted a new data service utilizing packet-switching techniques. In the above example, the total monthly cost from Hong Kong using these services would be about $51,000.

Costs to the user for this example are summarized in Figure 2.

From these simplified examples, the economic motivation for private enterprises and innovation is clear. Recall, also, that for purposes of this discussion, it was assumed that the services were identical; historically, this has not been the case.

A second observation is that recently implemented services from the public networks are beginning to "close the gap" between the economics of private networks and those of publicly available facilities.

Policy Issues

Policies set forth by governments have an effect on the direction of telecommunications evolution which is

probably greater than the more technically oriented aspects of networks. This section presents a brief summary of some of the policy issues that are influencing the direction of telecommunications development.

As shown in Figure 3, there are three major policy areas that affect telecommunications on an international scale. These areas of economics/informatics, data protection and telecommunications represent distinct issues which, when taken as a composite, are having a profound influence on telecommunications networks.

Each of these areas will be discussed here. A more complete discussion is presented in Reference 4.

	New York/Dallas	Ratio to Private Network	Hong Kong/-Dallas	Ratio to Private Network
Private Network	$ 1,610	1	$ 17,400	1
Direct Dial	15,100	9:1	130,000	7.5:1
Packet Network	2,800	1.7:1	51,000	3:1

Figure 2. Monthly Costs for New York and Hong Kong Examples

Economics/Informatics

Under current conditions, the countries of the world may loosely be divided into two categories. Countries such as the U.S. represent informatics-*independent* countries. As such, these countries tend to import (via telecommunications networks, for example) large amounts of raw data for processing and storage.

The exact converse exists for the informatics-*dependent* countries. They import relatively little raw data (again, via telecommunications networks) for processing but are heavily reliant upon the informatics independents for technical information and media products. This dichotomy leads to what has been termed the "imbalance problem."

From the perspective of the informatics dependents, this imbalance is perceived to have some or all of the following adverse effects:

- Reduced growth rate of the DP industry and profession.
- Loss of control over DP facilities.
- Technical domination by other countries.
- Technical dependence on other countries.
- Introduction of inappropriate technology.

When taken in composite, the concern by such countries is that of reduced national sovereignty.

It is, therefore, in response to these considerations that many governments are exercising great control over the flow of information and over the telecommunications networks that facilitate this flow.

The second major policy issue affecting the development of telecommunications networks is that of data protection. In the recent past, we have witnessed a greatly increased awareness on the part of both private and government sectors of data protection (data security). Several European nations passed privacy protection laws in the 1970s, most of them within the last two years. The Council of Europe is nearing completion on the draft of a treaty that would be binding upon its members. The Organization for Economic Cooperation and Development is drafting data protection guidelines that member nations would be expected to follow.

Why all of this sudden activity? What are the ramifications in regard to telecommunications network development?

The central, dominant issue is the basic rights of the individual. While other motives sometimes become ascribed to data protection legislation, these generally fall into either economic/informatics policies or telecommunications policies as depicted in Figure 3.

The advent of automated record-keeping systems capable of providing instantaneous access to billions of characters of information, coupled with worldwide access via telecommunications, has quickly focused attention on the new potentials for the abuse of basic human rights. Some of the concerns of such systems are:

- Proliferation.
- Vulnerability.
- Misuse.
- Accuracy.
- Completeness.
- Control.
- Transmittal.

The net result has been manifest in data protection laws passed in Austria, Canada, Denmark, France, Germany (F.R.), Luxembourg, Norway, Sweden and the U.S. The scope of these laws varies, further providing some elements of confusion and uncertainty.

The general effect of the data protection issue on telecommunications will most likely be to retard the development and proliferation of networks, especially those that cross international boundaries.

For some additional information on the privacy and security issues, see References 5 and 6.

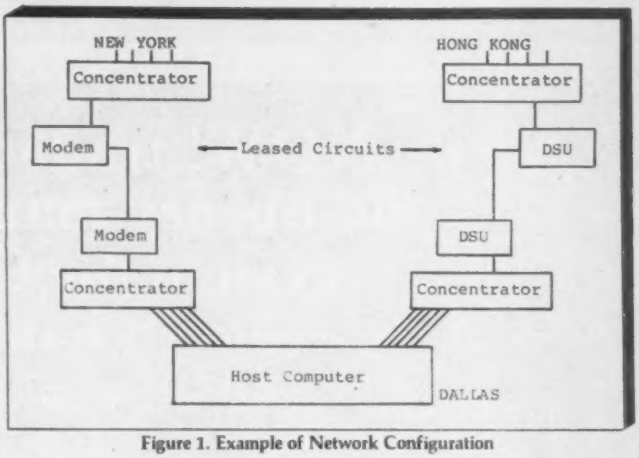

Figure 1. Example of Network Configuration

Telecommunications Policy

The third policy issue area depicted in Figure 3 is that of telecommunications policy. In the vast majority of the countries of the world, the provision of telecommunications is the responsibility of a governmental agency – generally the PTT.

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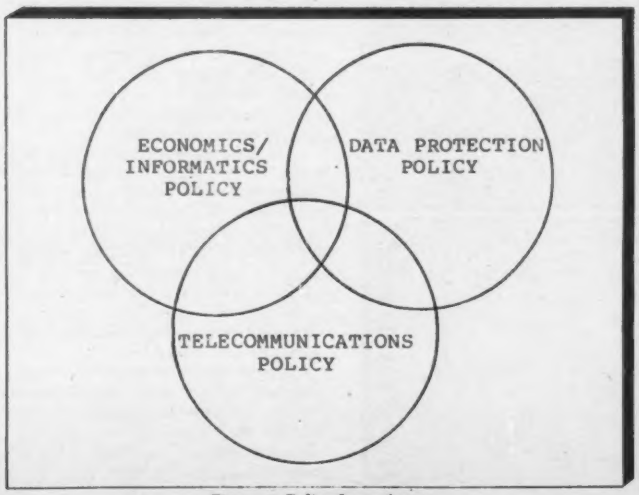

Figure 3. Policy Issue Areas

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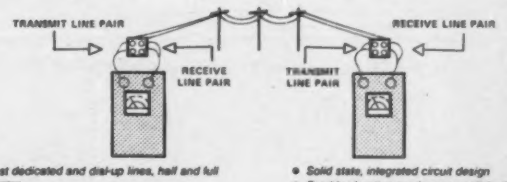

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(Continued from In Depth/7)

The prime function of these administrations is to provide the full range of communications services deemed necessary to support the national interests of their particular county. Secondly, and close behind this prime goal, is the requirement to generate income. In general, the postal services must be subsidized by the more lucrative telecommunication services.

Therefore, the world's PTTs will take a very dim view of any private network which, by virtue of its existence, could reduce total PTT income. In the early 1970s, the PTTs readily supplied telecommunications facilities to corporations implementing private networks. The revenue generated by these facilities was perceived by the PTTs as beneficial.

As these networks grew in capability, the concerns of the PTTs increased. Because of their highly efficient use of the available frequency spectrum of leased-line facilities, these networks were considered to be a threat to PTT revenue. This circumstance, coupled with the economic considerations discussed earlier, provides some clear insights into likely telecommunications policies.

The early '80s will see the introduction of numerous public data networks. Their use will be greatly encouraged by the telecommunications administration. This "encouragement" will be manifest in the form of one or more of the following:

1) Higher leased-line tariffs.
2) Denial of applications for new, private circuits.
3) Revocations of existing facilities.
4) Nationalistic pressures.

Technological Considerations

A wide variety of information is available describing the technological advances made in telecommunications over the last decade and predicting improvements and innovations over the forthcoming decade. While a comprehensive review of technology is beyond the scope of this article, a few of the major technological factors that will exert influence on network development are outlined below:

• *Satellites.* While communications satellites may be considered a technology of the '60s, innovative applications have been rather limited. The future will see a much more diverse use of satellites in a broad range of applications. The use of higher transmission frequencies will facilitate smaller antennae which, in turn, makes the often-discussed concept of the rooftop antenna closer to reality.

• *Hardware.* Paced by large-scale integration (LSI), the cost of telecommunications hardware devices is decreasing. While the technology may be approaching the point of diminishing returns, the cost of hardware, relative to the remainder of the system, is continuing to decrease.

• *Software.* The early pioneers in network development were forced to develop their own software at considerable expense. Now, some highly sophisticated software is available from vendors such as IBM (Systems Network Architecture), Digital Equipment Corp. (Decnet) and Comten, Inc. (CNA). The availability of this software provides the network designer with a valuable base from which to begin. The use of such "standard" software can help reduce overall software costs.

• *Fiber optics.* One of the major problems of telecommunications networks is the provision of the transmission path from major telephone company nodes to the extremities of the network — the so-called "local loop" problem. Recent experimental work has demonstrated that fiber optics could significantly reduce cost, increase bandwidth and provide a higher quality transmission path.

• *Digital transmission.* The vast majority of the world's installed telephone plant uses analog transmission techniques. For most future installations, digital transmission facilities are being installed. The principal advantage for data networks are a higher grade of service (that is, lower probability of bit error) and lower cost (modems are not required and transmission costs are lower).

• *Communications standards.* Over the last decade, telecommunications devices and networks progressed more rapidly than standardization efforts. As a consequence, one finds a multitude of incompatible networks in op-

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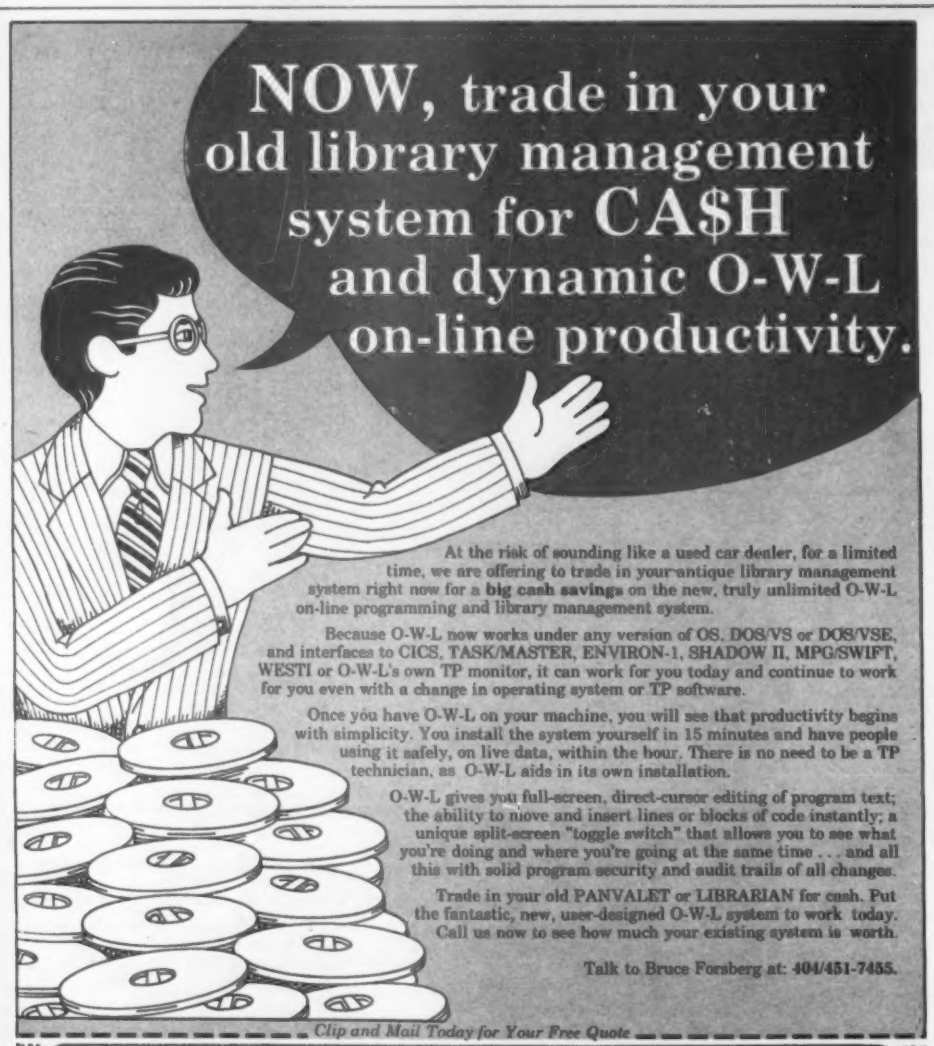

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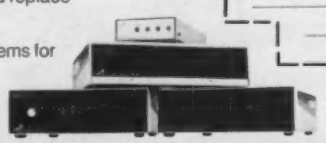

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(Continued from In Depth/8)

eration today.

Recently, much progress has been made in reaching agreements on standards on an international scale. Perhaps the most notable is the CCITT recommendation X.25 for host/network interfaces.

Technological developments tend to encourage network development on a much broader scale than ever before. Networks are becoming easier to design and implement, and their capabilities are becoming more diverse and more powerful.

Attempting to reduce the multitude of complexities of international telecommunications to a few brief conclusions is difficult, at best — and, perhaps, overly presumptuous. However, some directions seem likely.

1) The decade of the '80s will be a period of major change, bordering on revolution and upheaval, as the world's telecommunications administrations introduce public data networks.

2) The use and expansion of private telecommunications networks will receive increased scrutiny from telecommunications administrations. In some countries, applications for new services will be denied.

3) While the public networks will play a more dominant role, they will not be able to accommodate, from a technical perspective, all of the types of interfaces currently being demanded. This problem will be a significant factor in greatly prolonging the role of the private network.

4) Demand for services is likely to increase at a rate higher than can be accommodated by new public networks. This, too, will tend to assure the private networks of a major role.

5) The standardization and interconnection of various national public networks remains an unresolved issue. This, too, will tend to prolong the role of the private network.

6) Tariffs for services such as flat-rate, leased circuits are likely to increase substantially in order to encourage the use of public data services.

7) A major question is that of interconnection of public and private networks. Most likely, some limited interconnection will be permitted for cases in which the PTTs see a net positive increase in overall public network use.

Regardless of the precise outcome, the '80s will provide fascinating challenges for telecommunications planners and designers. It will be an era in which the role of technology will become progressively more subservient to policy and economics.

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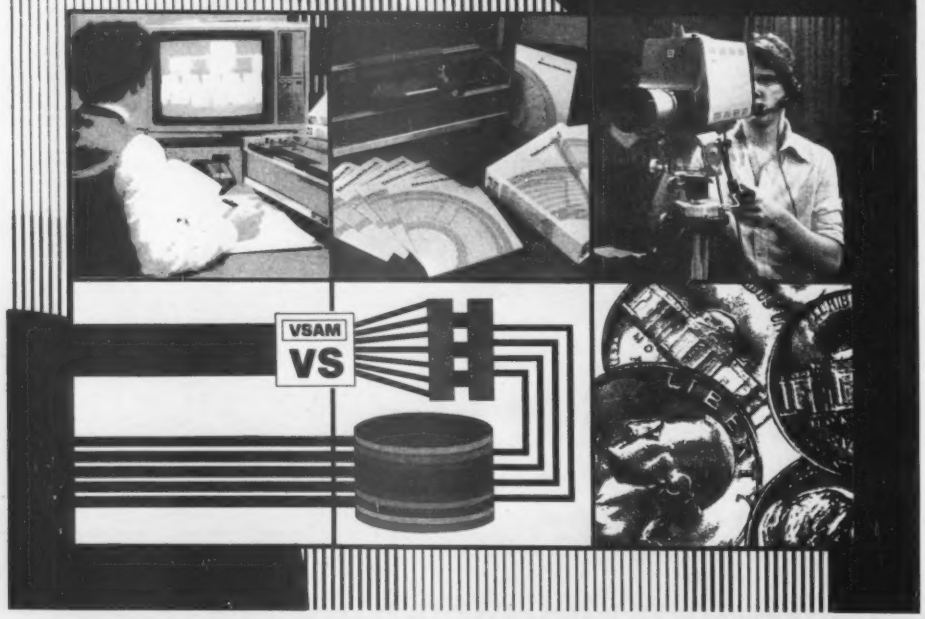

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Dr. Philip A. Tenkhoff is president of Network Communications International, a management consulting firm in Olympia, Wash.

From 1963 to 1979, Tenkhoff was an executive at Computer Sciences Corp. (CSC), most recently as vice-president, engineering and communications, for CSC's data services group. Tenkhoff was the senior executive responsible for the design and operation of the Infonet international network.

Tenkhoff holds a B.S. degree in electrical engineering from the University of Southern California and M.E.E. and Ph.D. degrees from The Catholic University of America.

Federal Agency Fights Inflation

Scheduling, Switching Cut User's Costs

By Gilbert Held
Special to CW

MACON, Ga. — A federal agency here cuts the costs of its national data communications networks by a combination of operational scheduling and circuit switching.

Other users could also benefit from these inflation-fighting techniques, which have reduced the leased lines needed by the Office of Personnel Management (OPM), resulting in more effective utilization of remaining facilities.

Although OPM is a small agency, its responsibility for recruitment, examinations, test scoring and retirement processing of federal employees makes the DP center in Macon a large consumer of data communications technology.

To appreciate how OPM benefits from scheduling and circuit switching, consider the network schematic illustrated in Figure 1.

In this example, the first remote batch terminal located in Washington, D.C., performs the sole function of "pulling" system output (Sysout) from a Honeywell, Inc. 66/80 computer in Macon. Only one circuit and a pair of modems are required to link that terminal to the front-end processor.

For the second remote batch terminal in Washington, in addition to "pulling" Sysout, it must also communicate with a remote batch terminal in Macon for tape-to-tape transmission. Therefore, two leased lines and two pairs of high-speed modems would normally be required to enable the second remote batch terminal to perform these functions.

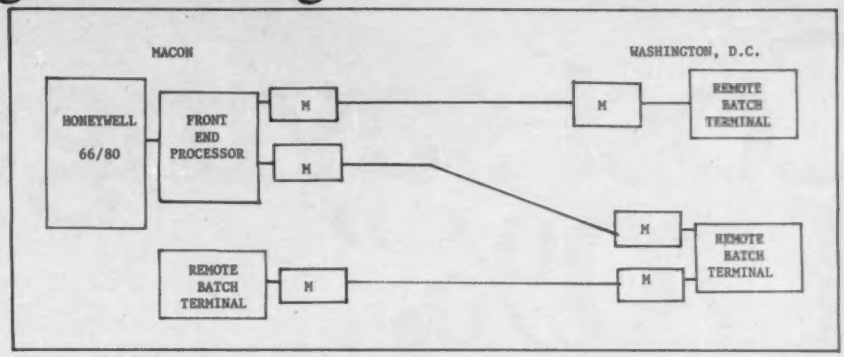

Figure 1: Initial Network Requirements. Communications costs can escalate when individual leased lines are employed to connect functional activities of devices.

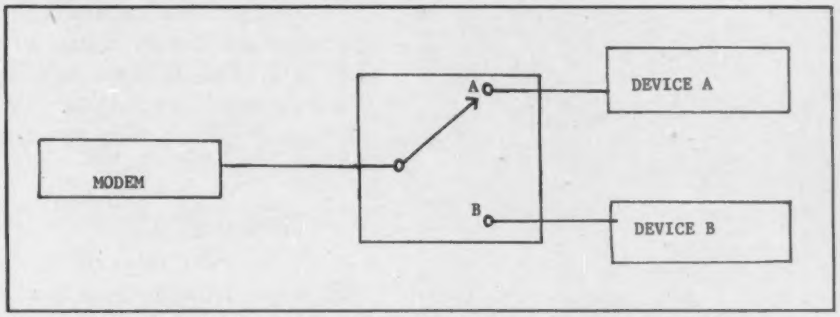

Figure 2: Fallback Switch. The switch permits multifunctional use of communications facilities.

From a study of operations, it was determined that tape-to-tape

(Continued on Page 56)

Users Facing Big Changes in '80s: ADL

By Marguerite Zientara
CW Staff

WAKEFIELD, Mass. — In the next decade, dynamic changes in telecommunications regulation, technology and user needs will result in basic changes in the industry structure and in increasing competition.

Such were the conclusions of a panel of Arthur D. Little, Inc. (ADL) staff members speaking here recently at ADL's Third Biennial Executive Forum.

Important trends in the U.S. that will affect the future of telecommunications include the following: Toll calls are outpacing local calls, multinational operations are driving more international traffic, more and more U.S. businesses are operating from geographically dispersed facilities and data communications is proliferating, according to Edgar Grabhorn. Grabhorn, a senior ADL staff member, recently completed ADL's world telecommunications study of 84 countries.

In addition, air travel costs are rising along with energy prices in general, creating a need for improved resource utilization and resulting in increased usage of mobile radio and the telephone, Grabhorn said.

Such rising costs have also resulted in a renewed interest in tele/video conferencing and in licensed land mobile radio stations. As for the latter, there were 150,000 in 1970, and that num-

(Continued on Page 58)

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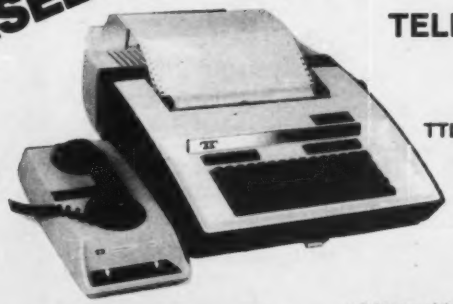

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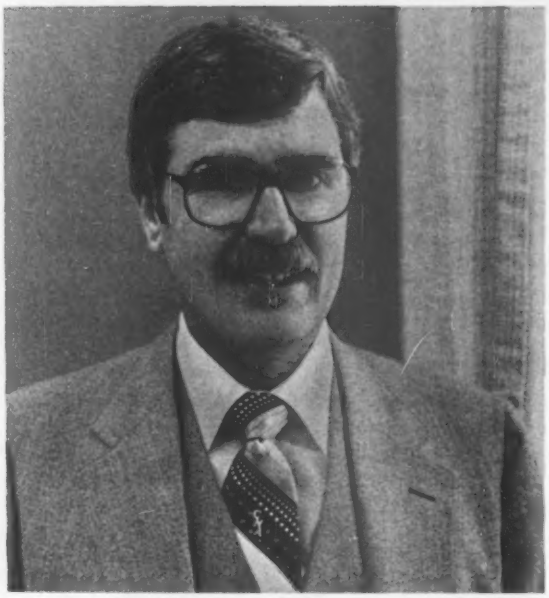

Chuck Anastasi, Manager, Timesharing Services, 3M, St. Paul, Minnesota.

Price/Performance.

"3M is a worldwide company with 47 U.S. operating divisions and subsidiaries.

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"Within 18 months we had installed two DECSYSTEM-2060s and were providing 75% of our U.S. timesharing requirements. Eventually, we'll have over 90% of our work done on the in-house computers.

"Our price/performance ratio is outstanding. The in-house service on the DECSYSTEM-2060s costs 30% of what it would cost to do outside. That's a cost savings of 70%, which is even more than we expected."

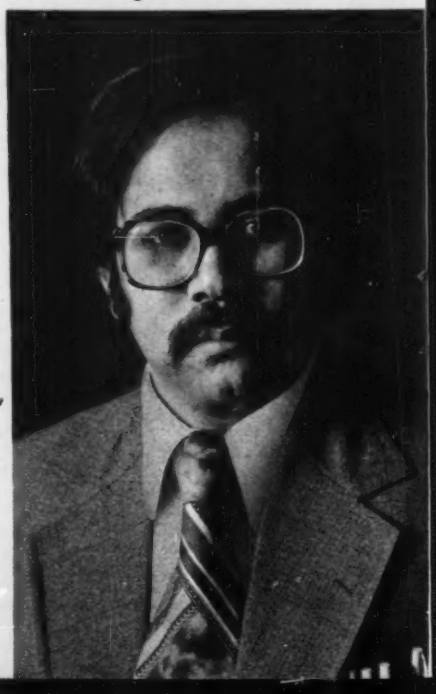
Versatility.

"The University of D.C. was created in 1976 as a consolidation of three colleges in the area.

"Initially U.D.C. had a batch system, but since it was already overloaded with administrative work, neither the faculty nor the students could get any computer time. We decided to get another system to share the workload and to improve services to the students and the faculty.

"We wanted a distributed system that could be used on all three campuses, and that meant an interactive DECSYSTEM-2060.

"Now we can use our DECSYSTEM-2060 any time day or night because our uptime is over 98%. Our applications range from word processing for producing proposals to sophisticated graphics, which we use extensively in our Physics, Chemistry, and Engineering departments. And response time is six times faster than with our batch system."



Dr. Daryao S. Khatri, Associate Professor, Physics Dept., University of the District of Columbia, Washington, D.C.

Ease of Use.

"At the Paulsboro Lab of Mobil Research, we do research and development for petroleum refining processes and products.

"Our laboratory was computerized with a network of PDP-8s and PDP-11 s. But to handle the enormous amount of data generated, we decided to add a computer as a database and for data analysis. APL was the language we needed, and we also wanted a system that was easy enough for everybody to use—scientists, engineers, technicians, and management people.

Dr. Dwight Prater, Sr. Scientist and Research Advisor, Mobil Research and Development Corporation, Paulsboro, New Jersey.

"Since most APL -systems on the market had been tested extensively, we knew the best system was APLSF on the DECSYSTEM-2060.

"Now we have up to 45 interactive users at any one time and virtually everybody here can run this system. Even some of the secretaries are trained in APL.

"With the DECSYSTEM-2060 and APLSF, data can be analyzed and processes are devel oped three to five times faster than before."

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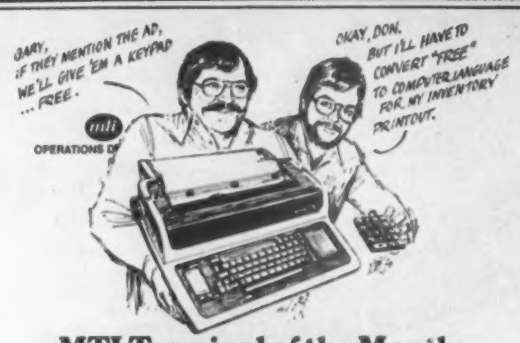

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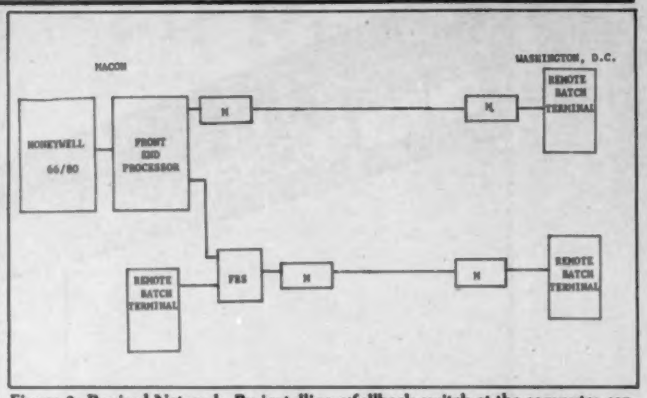

Figure 3: Revised Network. By installing a fallback switch at the computer center, a leased line, pair of high-speed modems and one remote batch terminal controller are eliminated.

Federal User Trims Costs

(Continued from Page 53)

transmission and Sysout pulling by the second remote batch terminal in Washington, D.C., could be scheduled so as not to conflict with each other. Based upon this fact, the office conducted an examination of the effect of circuit switching and equipment scheduling upon the previously required data communications facilities and remote batch terminal hardware.

In order to switch one circuit between two pieces of hardware, several devices were considered to include patch panels, fallback switches and matrix switches. Based upon the simplicity of the switching requirement, a simple two-position fallback switch was selected. The use of such a fallback switch is illustrated in Figure 2.

As illustrated, when in position A, device A is connected to the communications line and modem. When switched to position B, device A is placed off-line and device B is connected to the communications facility.

Revised Network

In Figure 3, the initial network has been revised to incorporate the use of one fallback switch and the functional scheduling of the operation of the remote batch terminal.

By the utilization of one fallback switch with a purchase price of approximately $120, a considerable amount of telecommunications equipment was rendered unnecessary and eliminated.

The equipment and the associated monthly costs that were eliminated were as follows: The leased line from Macon to Washington, D.C., cost $302.40 (560 miles at 54 cents a mile); two station terminals cost a total of $86.60; two modems cost $498; and the remote batch terminal controller cost $60.

Total expenses eliminated, therefore, were $947.

For commerical organizations, the savings would be slightly higher since in the preceding calculations the circuit was costed at a Telpak rate of 54 cents a mile.

As illustrated, the use of circuit switching and equipment scheduling can result in major financial benefits to an organization.

In this application, the one-time expenditure of $120 resulted in the elimination of a $947 monthly recurring cost. With an approximate four-day payback period to recoup one's initial investment, this is truly one technique that can be used to counter the effect of inflation, changing the famous advertising adage so it can now be stated that "I'd rather switch than pay."

Held is chief of data communications for the federal Office of Personnel Management and manages the design, development and operation of its national data communications network.

Codex Adds Matrix Switch

MANSFIELD, Mass. – A programmable, microprocessor-based electronic switching device that performs analog switching as well as digital matrix switching was introduced here by Codex Corp.

The Intelligent Matrix Switch (IMS) reportedly allows alternate routing configurations, stored off-line in nonvolatile memory, to be loaded on-line with a single command. The terminal-controlled digital matrix switching feature allows configuration instructions and status reports to be entered and displayed directly on the terminal screen.

Switch Features

Features also include full-duplex, terminal-controlled, real-time monitoring, tandem switching functions, front-end sparing and automated control for port contention and resource selection.

Optional software is offered for gathering traffic statistics and reporting connect/disconnect events for additional management and control.

Available in the second quarter of 1980, the IMS is priced from $25,000 to $78,000, with a typical system configuration of 128 ports by 128 ports costing $39,200 from Codex Corp. at 20 Cabot Blvd., Mansfield, Mass. 02048.

Correction

Advanced Computer Security Concepts of 4609 Logsdon Drive, Annandale, Va. 22003 has pointed out an error in coverage of its new data encryption system [CW, May 19]. As stated, downline loading of working encryption keys is not required with the product, but the article erred in stating that master keys are not required, a vendor spokesman said.

Vying With British, Canadians

French Planning Videotex Offering for U.S.

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — The only country which so far has succeeded in selling its on-line information technology to the U.S. is Great Britain; several months ago, General Telephone & Electronics Corp. (GTE) bought rights to Viewdata,the British videotex system.

But the French may not be far behind. The 3M Co. has announced plans to introduce a modified version of a new French facsimile terminal in the U.S. next year. Microband Corp., which distributes pay TV programs in several U.S. cities, has been experimenting for some time with Antiope/-Didon, a French interactive information retrieval system that utilizies a home television set as the terminal. And a growing number of U.S. on-line services vendors are reportedly interested in a new, low-cost, "electronic directory" terminal scheduled to be installed in several thousand French homes beginning next summer.

All of these components are being developed as part of France's "Telematique" program which, basically, is aimed at putting the entire country on-line within the next 20 years.

This computer-based information society will be created partly by providing the electronic directory terminal to all French telephone subscribers at no charge. They will then be able to access the name and number information now contained in printed telephone directories, as well as many other kinds of information. The French plan to recoup the costs of the giveaway by eliminating printed directories, doing away with human "information" operators and selling Telematique technology abroad.

Telematique Features

The latter job is chiefly the responsibility of Roy Bright, director of marketing for the Telematique program. Bright, who had a similar job at the British Post Office during Viewdata's formative years, discussed Telematique in detail during a recent visit to Washington.

"The electronic directory terminal, in quantities of less than 10,000 units, can now be manufactured for $300 per unit, and within the next two years, that price should be cut in half," he said.

The terminal includes a black-and-white CRT screen, full Ascii (64-key) keyboard and a modem. The screen employs a 6 by 8 dot matrix to form each character and can display 25 lines of 40 characters each. It provides a variety of auxiliary features, such as double-height, double-width characters; flashing; underlining; and inversion. Data can be received at 1,200 bit/sec and transmitted at 75 bit/sec.

Besides retrieving telephone directory information, the terminal can also access data bases containing many kinds of business information, Bright explained, and the French are busily promoting such applications both at home and abroad. They're also developing peripherals for the electronic directory terminal which can convert it into a low-cost "office of the future" capable of supporting electronic mail and teleconferencing.

The new digital fax machine, manufactured by Thomson-CSF, is one such peripheral. It's target price, according to Bright, is less than $500. Other peripherals now being developed include a "telewriter," an electronic table through which signatures and other handwritten or hand-drawn input can be transmitted over a standard telephone line plus microprocessor and floppy disk storage that would give the electronic directory terminal local DP capability.

Three-Way Race

A major goal of the Telematique program is to convince the rest of the world, particularly the U.S., the Antiope/Didon, the French videotex/teletext system, is superior to Britain's Prestel/Viewdata and Canada's Telidon technologies. To do that, France must develop a "critical mass" of users who can show that Antiope/Didon is commercially viable. Since Britain and Canada must do likewise to prove the viability of their systems, the countries are now involved in a threeway race.

The electronic directory is a key element in France's effort to win this race. Since the terminal will be able to access Antiope/Didon data bases as well as telephone directory information, each telephone subscriber, once he receives a free terminal, will become a prospect for the teleshopping, banking an other on-line services the French are developing for the home. And since the terminal will be free, it should be possible to reduce the charges for these services accordingly, thereby increasing the number of subscribers.

First Public Trial

Late this year, Bright reported, the French plan to launch the first public trial of a videotex-based home information service. (Several teletext services have been in operation for some time. The essential difference between the two technologies is that videotex operates on telephone circuits, while teletext utilizes cable or over-the-air TV channels.)

The upcoming test — in Velizy, a Paris suburb — will involve some 2,500 families and 150 to 200 information providers. Among the applications to be tested will be a teleshopping service that enables the user to buy merchandise on-line, as well as ordering it. The transaction will be consummated with the aid of a credit card reader attached to some of the test terminals.

In 1981, the French expect to begin a second test. This one will involve the new electronic directory terminals. Approximately 150,000 telephone subscribers in Western France will receive the equipment, Bright said, and they'll be able to access videotex as well as telephone directory services.

He declined to speculate on what would happen next, but it is probable that around the end of next year, the French will introduce a commercial videotex service. If enough of those 150,000 telephone directory terminal users in western France sign up, the French should then be able to sell Antiope/Didon systems in the U.S. and elsewhere and may pull ahead of Britain in the international videotex/teletex sweepstakes.

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Switching System Allows Control From Eight Stations

WILTON, Conn. — A Multiple-Access Switching System (Mass) that allows remote accessing, monitoring, testing and reconfiguration of network devices from up to eight centralized control stations is available from T-Bar, Inc.

Dubbed Mass+, the system reportedly permits manual or software-programmed control from a single operator position for monitoring and testing of one or several lines, individually or simultaneously.

With single command from the operator, Mass+ restores service to one or several failed front-end ports, a spokesman said, by switching to a backup unit. And "preprogrammed" switching of front-end ports can facilitate preventive maintenance and changes in applications, he added.

Further, Mass+ allows remote patching and substitution of spare modems at distant access points, the spokesman continued, with no local degradation of signals. Mass+ reportedly supports analog and digital testing with diagnostic instruments from one or more operator positions at any point within a geographically distributed worldwide system.

Finally, the switching system can produce a running record of network activity, including maintenance and task reconfigurations.

The operator console for Mass+ would be "any standard Ascii CRT terminal," according to T-Bar. The switching system's architecture handles up to 512 digital and/or 512 analog data lines, the spokesman stated.

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Changes for '80s Outlined

(Continued from Page 53)

ber will grow to 750,000 by 1985 and one million by 1990, Grabhorn projected.

More Choices

Furthermore, AT&T's changing role has resulted in more choices for users, Grabhorn said, noting that while AT&T is still the largest supplier of communications services, it no longer has a captive market and has been forced to compete worldwide in more markets.

In addition, new AT&T business services, such as it Advanced Communications Service (ACS), feature DP; AT&T has separate subsidiaries for terminal equipment and innovative services; its marketing orientation is aimed at business and residence; and it is cooperating with General Telephone & Electronics Corp. (GTE) on Comstar.

Furthermore, there are now "many more players" in the telecommunications game. Many are foreign, but others are U.S. nontelecommunications firms such as IBM, Xerox Corp., NCR Corp., Datapoint Corp., Rolm Corp., Control Data Corp. and Computer Sciences Corp.

Total projected telecommunications operating revenues for 1990 are $385 billion (in 1980 dollars), with $173 billion or 45% of that going to Europe, $116 billion or 30% to North America (10% of that being Canada's), $77 billion or 20% to Asia and $19 billion or 5% to other countries.

Largest Sector

Telephone will continue to be the biggest market sector through the decade, with telegraph, Telex and data communications next, followed by satellite communications, mobile radio, radio paging and CATV, all of which are and will continue to be growing, Grabhorn said.

Expounding on the ADL report, "The Merging of Telecommunications and Information Processing," was Arthur H. Solomon, deputy manager of the Telecommunications Sciences section, who concluded that "either telecommunications companies or computer companies can try their luck in the other's market with a little acquired help."

Presenting first a historical perspective on digital communications, Solomon noted that "information processing concepts in telephone networks predated modern computers by more than 100 years in such areas as dial pulse signaling, storage and retransmission, electromagnetic relay logic devices and common control switching."

Through a chronological listing of technological breakthroughs beginning with the semaphore and smoke signals, Solomon illustrated that "information processing technology is deeply rooted in the development of telecommunications.

"While the information processing industry in partnership with the semiconductor industry stimulated rapid innovation in solid-state electronics," Solomon noted, "the telecommunications industry was slower to absorb the new technology than the information processing industry."

The reason? "In the late 1940s to mid-1950s, solid-state was an untried technology," Solomon explained. "The clunky old-telephone system of electromechanical switches was highly reliable and was in place with millions of dollars invested."

Future Business Communications

As for the future of the business communications system, some people have the "naive dream" that "the PABX will be the only important element of it," Solomon said. "Everything else — including computers, facsimile, telephones, terminals and word processors — would be peripheral.

"That won't occur in the near future," he predicted, adding that any trend toward integration of DP and telecommunications will be evolutionary, with separate systems for voice and data expected to remain "for many years."

The key technologies that will affect integration of telecommunications and DP are processor hardware and software, data compression techniques, stored program control digital switching and high-speed digital transmission, he noted.

"With more voice being transmitted than there'll ever be data, and with lower and lower bit rates coming, growth is aimed at lowering the cost of telecommunications and making it useful for more applications," Solomon concluded.

As for the experimental videotex systems now starting up around the world, "there is no data consumer demand, although there is intense international and cross-industry interest in it," according to Peter D. Shapiro, senior ADL staff member in telecommunications sciences.

Key issues in the area of videotex are business vs. residential consumer demand; the role of AT&T, which faces possible regulatory problems; videotex standards that have yet to be developed; and the technological challenges of graphics capability and cost, Shapiro said.

"The long-term outlook is that it could be a new mass medium," he speculated.

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Analyzer Monitors SDLC, SNA Net Traffic

SIMI VALLEY, Calif. — A network analyzer that determines the effect of hardware and software changes to on-line systems using IBM 3270-family and other terminals under Synchronous Data Link Control (SDLC) and Systems Network Architecture (SNA) protocols is available from Teleprocessing Products, Inc.

When equipped with the optional printer interface and provided with a printer, the TP-270 can create a hard-copy printout of individual functions or a complete status report. The device also measures response time and the elements contributing to it, the vendor claimed.

A remote control two-way communication option is available, and a remote intelligent device can be programmed to issue 19 commands to the analyzer, allowing full exercise of front panel functions, the vendor claimed.

Using the TP-270, a network can be restructured to deal with the volume of data being transferred at any individual terminal, the spokesman said.

The analyzer costs $2,875 and is available within 30 days, Teleprocessing Products, Inc. said from Building 7K, 4565 E. Industrial St., Simi Valley, Calif. 93063.

Technical Committee on OSI Joins Ansi X3 Organization

WASHINGTON, D.C. — A technical committee on open systems interconnection (OSI) has joined the American National Standards Institute's (Ansi) X3 organization, which promulgates commercial DP standards.

The X3T5 committee on OSI addresses communications between DP equipment of various types and will oversee the X3's OSI reference model. Now recognized by the International Standards Organization, International Telegraph and Telephone Consultative Committee and European Computer Manufacturers Association, the OSI reference model consists of seven hierarchical layers.

Layers 1 through 7, respectively, are the following:

- Physical layer, providing bit transmission across a physical medium.
- Data link layer, enabling logical message sequences to pass across a single physical data link.
- Network layer, transferring data between network nodes.
- Transport layer, for end-to-end transport of data from a source session-entity in one open system to a destination session-entity in another open system.
- Session layer, providing "sessions" — structured dialog between presentation-entities on behalf of application-processes.
- Presentation layer, rendering data transformation and formatting services to the application layer.
- Application layer, supporting application-processes in the application environment of the open system.

Committee's Goal

"The goal of [X3T5] is to enable cooperative structured dialogs to be easily and reliably activated, maintained and deactivated between any application-processes located in any open systems in the world," a spokesman said. The Ansi committee intends to reach its goal by developing standards for OSI protocols within the next two to four years.

X3T5 has divided into three task groups: X3T5.1, X3T5.5 and X3T5.6, which are concerned with architecture, the application and presentation layers and the session and transport layers, respectively.

The committee's first meeting is slated for June 26 at 9 a.m. at Hewlett-Packard Co.'s Data Systems Division, 11000 Wolfe Road, Cupertino, Calif. 95014.

More information on X3T5 is available from John Day, X3T5.1 convenor, at Digital Technology, Inc., 302 E. John St., Champaign, Ill. 61820; X3T5.5 convenor Lloyd L. Hollis at IBM, P.O. Box 12195, E98/002-1W, Research Triangle Park, N.C. 27709 and X3T5.6 convenor Joseph P. McGovern of Univac at P.O. Box 500, C2-SE1, Blue Bell, Pa. 19424.

Rack Takes 16 DAA Modules

NEW BRIGHTON, Minn. — Bell and Bell-compatible Data Access Arrangement (DAA) modules can now be mounted in a standard EIA-sized 19-in. mounting rack from Multi-Tech Systems, Inc.

The CC101 will accept up to 16 Bell-type models CDT 1000A, CBT 1000B or CBT 1000DAAs, which are mounted vertically.

The CC101 measures approximately 19-in. wide by 11-in. high by 9-in. deep, weighs 5.5 lbs and costs $100 from the vendor at 82 Second Ave. S.E., New Brighton, Minn. 55112.

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How much for this piece of futuristic technology? Just $3000 for a practical device that can be used with FORTRAN, COBOL or any other programming language. And for Lear Siegler users, the Heuristics 5000 board-level unit fits right inside the ADM-3A terminal and costs only $2,000.

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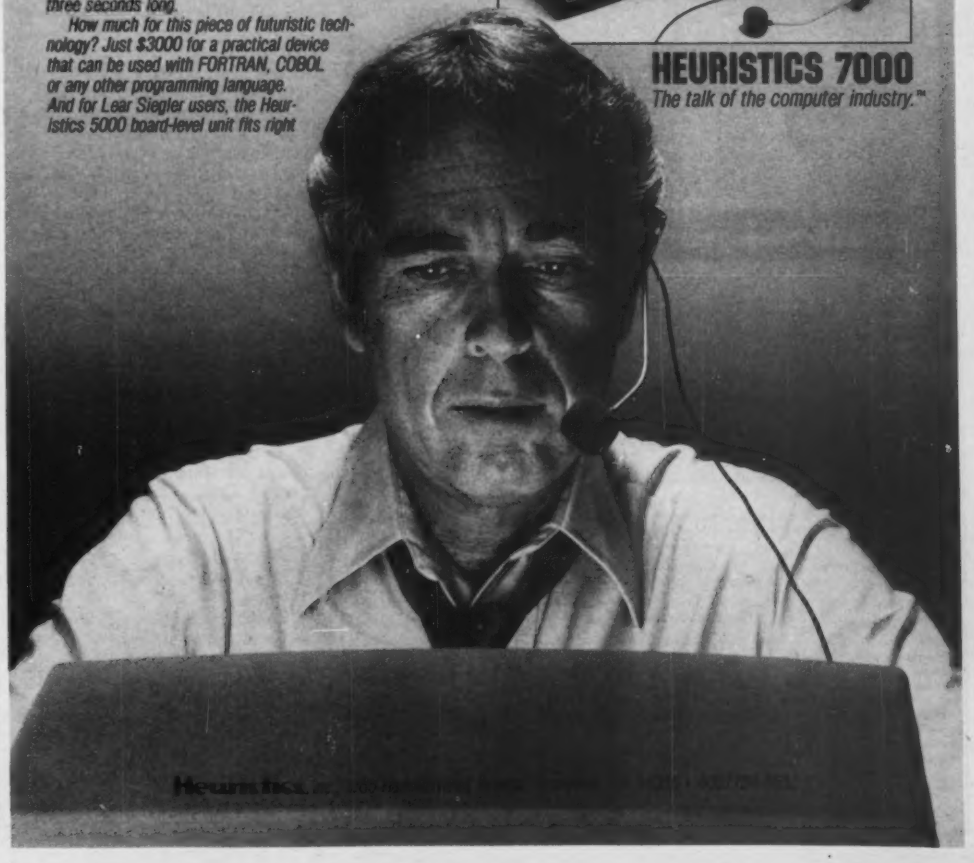


Front End Uses HP 1000 Mini; Aimed at Users Of HP 3000

OKEMOS, Mich. — A front-end processor offering on-line, transaction-based processing options to Hewlett-Packard Co. HP 3000 users is available from Systems Research, Inc. (SRI).

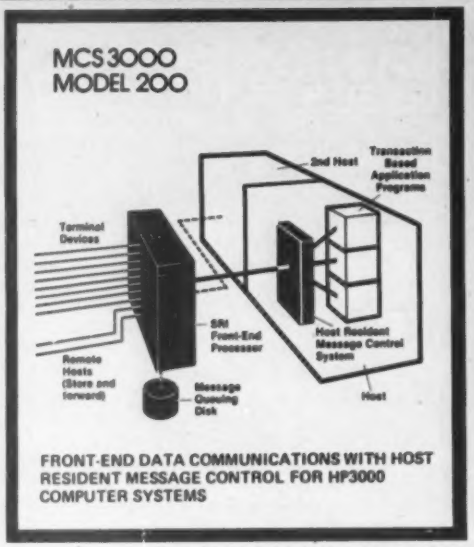
The MCS3000 Model 300 incorporates architecture for message control and data communications into an HP 1000 minicomputer. The host HP 3000 supports MCS3000 as a channel-interfaced, standard device, without modification to the HP MPE operating system or use of a privileged mode, the vendor claimed.

The Model 300 was designed for general-purpose use and has been installed for a variety of cross-industry users including banks, service bureaus and manufacturers, a spokesman said.

Available data communications controllers supportable by the MCS3000 include asynchronous/full-duplex up to 2,400 bit/sec, asynchronous/half-duplex up to 9,600 bit/sec and synchronous/half-duplex up to 19.2 K bit/sec, the vendor claimed. MCS3000 features a 150K bit/sec throughput rate and support for 208 low-speed or 43 high-speed data lines. Some users are running in excess of 100 terminals and printers with it, SRI claimed.

The Model 300 consists of the HP 1000 processor, 256 bytes of fault-control memory, a 20M-byte disk, a console and a table-driven, front-end-resident control system.

The cost for the MCS3000 is $74,750 and delivery is available within 10 weeks, the vendor said from 2400 Science Pkwy. Okemos, Mich. 48864.



The MCS3000 Model 300 joins SRI's Model 200 as a front end for the HP 3000.

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Objections to Telemail May Delay July Startup

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Telemail, the electronic message service announced recently by GTE/Telenet Communications Corp. [CW, April 7], may not go into operation July 14 as originally planned.

The Federal Communications Commission (FCC) is considering whether to defer startup of the service until Aug. 1 to allow more time for study of objections raised by the Computer Corporation of America (CCA), which offers a competing service called "Comet."

CCA contends that Telenet, among other things, is short-changing customers of its long-established packet-switched services to get Telemail into operation.

At a Telenet users group meeting last March, "numerous participants expressed concern over Telenet's level of support and maintenance for its existing facilities," CCA told the commission. "In particular, it was noted that the network was becoming 'overbooked' and Telenet was installing new network nodes without backup computers."

CCA, which relies on the Telenet packet-switched network to support its Comet service, added that several Comet customers who recently requested access to Telenet's Allentown, Pa., node had to wait 30 to 60 days to obtain service.

Pointing out that Telenet lost $9 million in 1979 on revenues of $15 million, CCA said that "Telenet's commitment to its underlying network may be waning as it devotes increased . . . capital and resources in pursuance of Telemail and other network services. To the extent that these . . . services threaten Telenet's basic . . . offerings and even its financial viability, [the FCC] has an obligation to protect the public from the resultant harm."

Bundled Rates

CCA also suggested that Telemail's bundled rates — which combine the charges for transmission and message processing — mask illegal cross-subsidies and give Telemail customers discounts not offered to patrons of the company's other services.

In its answer to these charges, filed last week, GTE/Telenet said the bundling of Telemail charges is "merely an attempt to simplify the rate structure . . . This approach was considered desirable . . . to make the Telemail tariff as nontechnical as possible. Unlike current users of Telenet's services, the typical purchaser of Telemail services will be a person with little or no technical background who would have difficulty understanding the concept of packets and estimating . . . what his packet usage would be."

Datacorder Gains Options

SEATTLE — A parallel printer interface and floppy disk drive are available for International Entry Systems, Inc.'s (IESI) Datacorder series of distributed data entry terminals.

The parallel interface, which supports both Centronics Data Computer Corp. and Texas Instruments, Inc. printers, can print data being entered or received, according to the firm.

Priced at $270, the interface would be used with Datacorder I and II intelligent terminals with front-end processing capabilities, cassette and floppy disk storage, and prompting and data checking features.

The optional floppy disk drive, priced at $2,795, was designed for use in situations requiring random access of a data base. The double-density, 5-1/4-in. floppies provide storage for 182K characters.

IESI is located at 408 N.E. 72nd St., Seattle, Wash. 98115.

Alternative to Telefile Offering

Modutest CPU Emulates Xerox Sigma 9

By Rita Shoor
CW Staff

PHOENIX, Ariz. — An alternative to the T-85 Xerox Corp. Sigma 9 emulator recently introduced by Telefile Computer Products, Inc. [CW, April 14] is available from Modutest Systems, Inc.

The announcement provided one more illustration of how quickly the market can change in the world of DP systems. Two months ago, a Telefile spokesman had described that company as having the only machine (other than a Xerox CPU) that could run Xerox CP-V software.

The Mod 9 computer developed by Modutest provides software compatibility so that the CP-V software reportedly favored by many members of the Xerox user base can be utilized, according to Lothar Mueller, Modutest senior vice-president.

In addition to the software compatibility, the Mod 9 mainframe is said to be hardware-compatible with all 32-bit Sigma series machines. "You can take a circuit board from the Sigma 9 and plug it into the Mod 9 or go in the opposite direction," Mueller said.

Execution speed of the Modutest mainframe is equal to or sometimes faster than the Sigma 9, the company claimed. This increase can be attributed to the Mod 9's main memory, purchased from Ampex Corp., which "has a slightly faster cycle time than Xerox memory," Mueller said.

Training, Maintenance

Field engineer training is also being offered for a fee to Modutest customers, he continued, and the company provides maintenance for the currently available CP-V software.

The Mod 9 in a typical configuration of one CPU type A and B multiplexing I/O processor (Miop) and 256K words of memory with associated power supplies is contained in five cabinets. This results in saving "in excess of 60%" of the floor space required for a comparable Sigma 9 configuration, according to the company.

Modutest Systems, Inc. was formed in October and is competing directly with Telefile for Xerox Sigma series customers, Mueller said. In addition to the Mod 9, backup and repair facilities are available from Modutest, Inc., an associated firm that stocks components and finished assemblies for the Xerox base, he noted.

A Mod 9 system with one CPU, an A and B Miop and 256K words of memory costs approximately $360,000 and is available with 30 to 60 days of lead time.

Modutest includes a one-year warranty for the CPU and Miop, and leasing terms are also available. The company is at Suite 6, 10632 N. 21st Ave., Phoenix, Ariz. 85029.

Univac Adds Array Processor Subsystem

BLUE BELL, Pa. — An array processor subsystem (APS) designed to extend computer capabilities for applications that involve processing large quantities of numeric data has been introduced by Univac.

As illustrated by the system architecture chart, the APS operates in conjunction with the Univac 1100/80 host computer under the 1100's operating system.

The APS reportedly offers an increase in the speed of floating-point arithmetic operations, the elimination of data transfer "bottlenecks" between the host computer and scientific processor elements and the solution to "very large" multidimensional problems, according to a company spokesman.

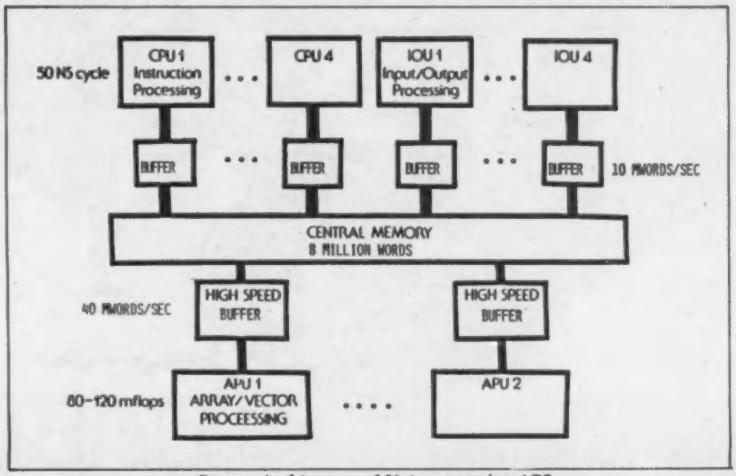
It has a maximum execution burst rate of 120 million floating point operation/sec (Flops) and a sustainable rate — for suitable algorithms — of 80 million Flops, the company claimed. Maximum system performance of 245 million Flops, including host performance, is reportedly realized when two of the array processors are linked to the 1100/84.

Direct interface to main storage and a high-speed cache memory are utilized to provide data transfer speeds of 35 million to 40 million 36-bit word/sec and, the Univac spokesman continued, the APS is capable of executing up to 8-million-word memory problems in a single vector operation.

All APS arithmetic is compatible with the 1100/80 host and the processor is user microprogrammable with a 288-bit instruction word size.

Under a five-year agreement, the APS can be leased for $28,000/mo. The purchase price is $950,000 and monthly maintenance costs $3,020. Optional support services are separately priced at $300/mo.

Additional information is available from Univac, P.O. Box 500, Blue Bell, Pa. 19424.



System Architecture of Univac 1100/80-APS

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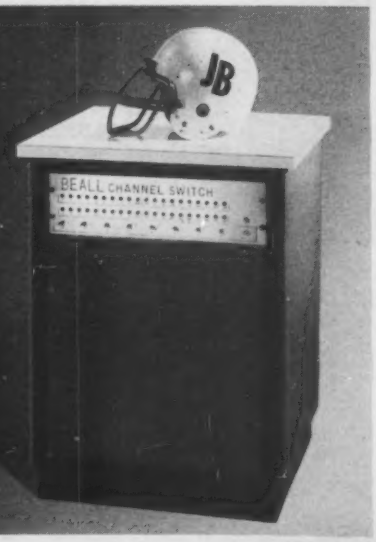

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System Lets Insurer Prepare Proposals Locally

PHILADELPHIA — Provident Mutual Life Insurance Co. here has installed a complete network of minicomputers in 50 of its agencies and five branch offices in approximately nine months.

The network, supported by Wang Laboratories, Inc.'s 2200 VP and PSCII-A machines, was designed to run Sigma Software, Inc.'s Client Analysis and Service System (Class), which allows life, group and health insurance proposals to be prepared within each local office.

Prior to installing the minicomputer system, agents would request insurance proposals from the home office where they were generated on a Burroughs Corp. B4800 mainframe. From the seven days formerly required to process and mail the proposals from the company's Philadelphia headquarters, the system now lets agents prepare some documents "in as little as five minutes," the company claimed.

In addition to generating illustrations of various insurance plans, the system is sometimes used for word processing functions, according to F. William Pfordt, field computer coordinator responsible for the system's installation.

He described a client file containing numeric codes to indicate such data as income, occupation and birth date. Each agency designs a record to meet its own needs, and the file can be sorted according to the criteria in which an agent is particularly interested. Sorting on income or occupation to identify prospects for a tax shelter plan was a typical example.

Installation at the 55 locations was handled mainly by three Provident technicians who traveled to offices spread across the U.S. on an every-other-week basis.

'Good Job'

Wang "did a very good job" in meeting the delivery schedule requirements involved in getting the right machine to the right location at the right time, Pfordt noted.

He could recall only a few occasions when the mini arrived late and, he continued, in one or two of those cases the vendor arranged for a loaner to be brought in so that the "massive delivery schedule" would not be disrupted.

An agency received the machines if minimum commission requirements were met and if it was operating within its expense ratio, the company spokesman observed. Both the PSC-IIA with either 16K bytes or 32K bytes of main memory and the 32K-byte 2200VPs are tied to Diablo Systems, Inc. 2281 printers.

In addition, the 2200 VP can be partitioned into multiple workstations by adding more components.

Based upon figures that Pfordt obtained from the vendor, the cost for partitioning the mini to handle multiple terminals would be approximately $6,500. Each workstation would cost in the neighborhood of $9,500, with additional monthly maintenance fee of $109.50 workstation.

The estimated cost for changing application programs to run on the reconfigured machines would probably range from $1,500 to $2,000, Pfordt said.

Class was installed at a cost of approximately $2 million.

Provident, with corporate assets making it about the thirtieth-largest life insurance company in the U.S., plans to amortize the expense within five years.

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Ramtek Expands 6000 Series Of Color Graphics CPUs

SANTA CLARA, Calif. — Ramtek Corp. has broadened its 6000 series graphics computer family with a model that reportedly offers four times the resolution, eight times the color selection and 25 times the vector writing speeds of other models.

The 6214 is also said to offer both 30- and 60Hz memory refresh rates. It is hardware- and software-compatible with the Ramtek 6114 Colographic computer, allowing easy upgrade from one system to the next, according to the firm.

The 6214 offers resolution of 640 by 480 picture elements, a company spokesman said. Four refresh memory planes under the control of a software loadable video lookup table will support up to 16 displayable colors from a palette of 64, eight colors plus an alphanumeric overlay or eight colors plus a blink function.

Grafpro Package

The 6214 utilizes a licensed version of UCSD Pascal. An optional vector generator enables vectors to be written at the rate of .8 msec/pixel, 25 times the speed of the 6114, the spokesman claimed.

Also available with the 6214 is Ramtek's Graphics Procedures (Grafpro) software package consisting of a set of routines and procedures consistent with the 1979 Siggraph Level One, two-dimensional proposed core standard.

Grafpro is said to facilitate programming for business charts, computer-aided instruction, process control, plotting, forecasting and modeling and statistical analysis.

In its basic configuration, the 6214 consists of a Z-80 central processor operating at 4mHz with 64K bytes of programmable memory, a floppy disk controller, a 250K or 512K byte floppy disk drive, color monitor, keyboard, pedestal display unit and the Pascal operating system.

The standard 6214 Colorgraphic computer costs $19,250 with delivery scheduled to begin in July. A rack-mounted version consisting of a chassis, power supply, processor card and memory/video card for 640 by 512 by 4 planes costs $10,250.

Additional interfaces to a host CPU, printer, plotter and data tablet are available from Ramtek, 2211 Lawson Lane, Santa Clara, Calif. 95050.

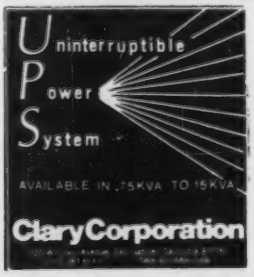
The Ramtek 6214 Colorgraphic Computer

Power Systems Have Mimic Bus

ELK GROVE VILLAGE, Ill. — A line of 12-step Unlimited Power Supply (UPS) systems featuring a mimic bus layout to provide a visual representation of the system power flow has been unveiled by Sola Electric here.

The UPS systems are available in 75-, 100- and 150-kVA models, range in weight from 4,600 lb to 7,000 lb without the battery bank and measure 70 in. long by 36 in. deep by 88 in. high.

Features include an internal status/alarm panel and an automatic manual retransfer selector switch to permit the operator to manually override major system functions. The UPS is priced in the $60,000 range, not including the batteries, from Sola Electric, 1717 Busse Road, Elk Grove Village, Ill. 60007.



Take a close look.
The VISUAL 200 not only emulates competitive terminals ...it obsoletes them.

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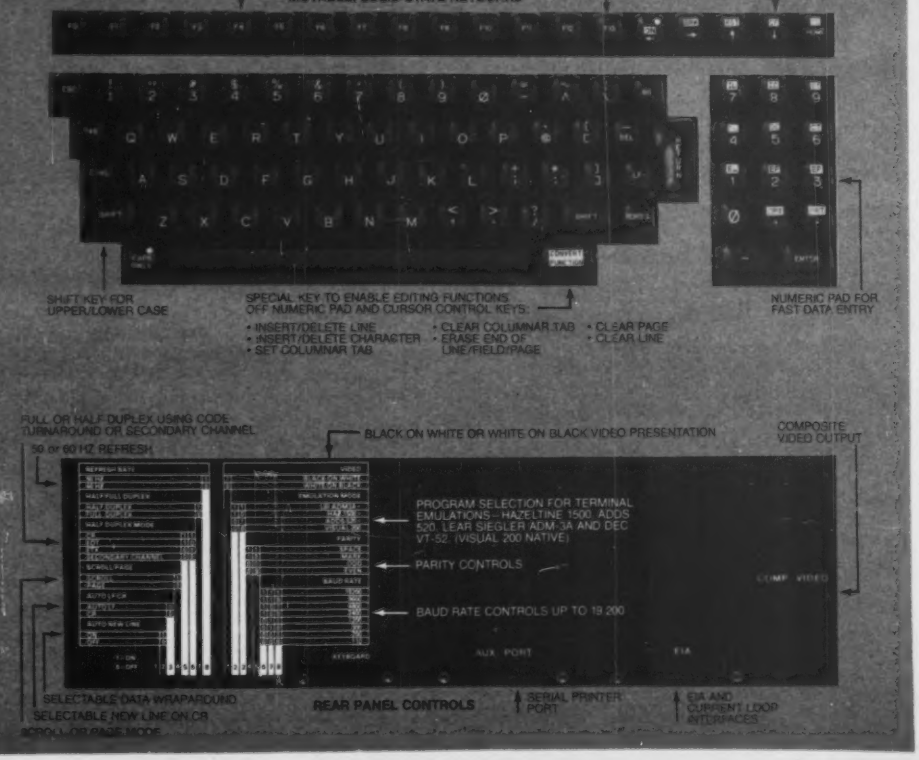

As Construction Prices Fluctuate

Electrical Firm's Upgrade Keeps Reports Current

WILSON, N.C. — "Prices are so volatile right now in the construction industry that we had to increase our reporting capabilities to focus on construction strategy as well as accounting information," according to Robert W. Watson, staff assistant in the General Management Division of Watson Electrical Construction Co. here.

So the company converted from a manual system to an NCR Corp. 399 and then upgraded to its current NCR Century 8200 within a four-year period.

The initial conversion took approximately 12 months and was "almost an even trade-off in terms of cost," Watson said. Although the hardware cost for the upgrade in 1977 was approximately $50,000, Watson felt the intangible benefits received from more timely reports in an industry that traditionally has relied on "seat-of-the-pants" analyses could not be measured adequately.

When questioned about vendor support, Watson stated that although the hardware maintenance was "quite satisfactory, we're a little disappointed in the software support of NCR's operating system. Conflicting reports are being received on new levels of the system software."

Although various software packages have been reviewed periodically, the company has elected to develop all its applications internally. Programming is done in Cobol at three NCR 796 CRT terminals in an environment that includes NCR 656 disk packs, a 200 line/min printer and 104K bytes of main memory.

Future plans may include tying in several outlying divisions to the main processor.

Storage System Plug-Compatible To Univac 1100

VAN NUYS, Calif. — A Univac 8450-type disk storage subsystem said to provide increased throughput has been announced by Interscience Systems, Inc.

The 8450/5046 subsystem, which is plug-compatible to Univac 1100 series computers when emulating the Univac 5046/8450, 8433 and 8430 subsystems, includes the Interscience 5046 storage control unit and up to 32 Interscience disk units of the 8450, 8430 or 8433 type which may be mixed in the same subsystem, a company spokesman said.

Reportedly featuring a greater number of tracks per cylinder than the Univac 8450 disk unit, the Interscience 8450/-5046 is said to require less head positioning to access the same amount of data. The average seek time is therefore reduced by 20%, thus providing increased throughput, a vender spokesman said.

A typical configuration consisting of a dual disk controller and four tape drives costs $246,000 from Interscience Systems, 7814 Burnet Ave., Van Nuys, Calif. 91405.

SLI Introduces Disk Subsystem

WOODLAND HILLS, Calif. — SLI Industries, Inc. here unwrapped the Cheyenne disk subsystem with a reported track-to-track access time of 9 msec and an average access time of 35 msec.

The unit features a maximum capacity of 51.4M bytes of unformatted data. Micro-Buss, Storage Module Drive and Ansi interfaces are available.

The Cheyenne is priced at under $3,000 in 1,000-unit OEM quantities from SLI Industries, 21040 Victory Blvd., Woodland Hills, Calif. 91367.

Why your next terminal should come from a communications company.

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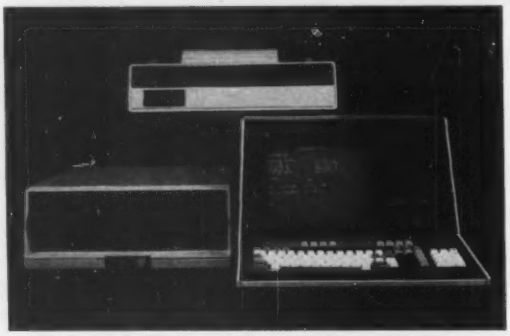
A modular hardware design permits the CDX-68 to range in configuration from passive display terminals to stand-alone systems to sophisticated networks for distributed processing applications (with up to 56K bytes of user memory and up to 40 Mb of on-line data storage, as well as a variety of printers). An extensive array of software includes ANSI 74 COBOL, BASIC, FORTRAN, MPL, a macroassembler and the CODOS Disk Operating System. Communications can take place using a variety of protocols, including 2780, 3780, HASP Multileaving, and asynchronous disciplines.



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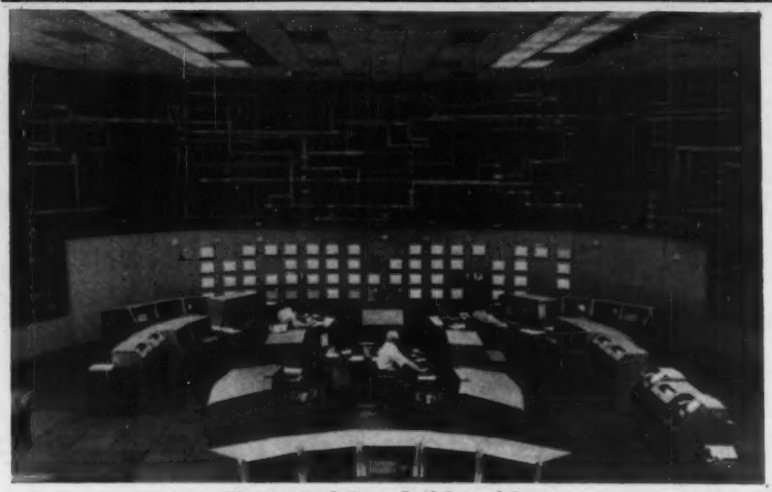

The New York Power Pool Control Center

New York Power Control Center Coordinates State Electric Needs

GUILDERLAND, N.Y. — For every moment of every day for 10 years, the workers at New York Power Pool's Control Center here have used computers to help make possible such common acts as turning on a light, running an appliance or operating a machine.

Currently based on two National Advanced Systems, Inc. (NAS) Model AS/6 processors and a slew of peripheral equipment, the control center affects the provision of more than 99% of the electric energy consumed by the 18 million residents of the Empire State.

The control center opened in February 1970, "providing the skilled personnel, communications and computer technologies required to maximize the reliable and economic operation of the statewide interconnected electric power system," according to William J. Balet, executive director of the pool.

Eight-Year Project

After eight years of development, the computer-directed economic dispatch system was perfected in 1977, enabling "constant communications with the pool's eight member systems to coordinate their efforts to meet the ever-changing demand for electric energy," Balet said.

"Both reliability and economy to the consumer are obtained through the transfer of electricity from one member system to another under the pool's control and supervision.

"The Power Control Center monitors generation and transmission of electricity on a 24-hour basis. If a shortage is anticipated based on consultations with member systems, a purchase to meet the demands is made from another system's supply or from neighboring areas in the U.S. and Canada," Balet explained.

Economy is achieved when less expensive sources of electricity are used to replace supplies from more expensive sources.

Because electricity from coal and nuclear plants is less costly than from oil-fired plants — oil accounts for almost half the electricity generated in New York — consumers save money when the electricity from more economical plants is transferred to replace the more expensive supplies, Balet claimed.

Through use of the computer-directed dispatch system that automatically controls the output of selected electric generators within the state, the operation of the non-oil-fired — coal, nuclear and hydroelectric — generators is maximized.

To the extent possible, the use of oil-fired generators is minimized. The consumption of costly imported residual oil and $2 distillate oil is thereby reduced, according to Balet.

Run-of-the-river hydroelectric generation, the least expensive source of electricity, and nuclear generating units, the second least expensive, are usually run to meet "base load" electric demand.

"That is, they are running at their maximum output as much as possible, thereby satisfying a portion of the ever-present demand for electric energy with the cheapest power available," Balet explained.

Beyond Base Load

As the use of electricity fluctuates above the base load demand, coal- and oil-fired generators are "dispatched" by the Power Control Center's computer relative to their individual efficiencies and with regard for overall system reliability.

Although the New York Power Pool was not the first pooling arrangement in the country, according to Balet, "it was the first central effort to coordinate power production and distribution on a statewide basis."

Other components of the computer installation include two 4,000K-byte NAS main memory units and two NAS 1,600M-byte shared bulk-memory subsystems. In addition, there are two IBM 3705 communications controllers operating more than 16 4,800 bit/sec leased communications lines to the eight remote locations.

Other equipment includes two IBM 4278 and two Aydin Controls, Inc. digital TV control units, five IBM 4555 and six Aydin dispatcher consoles and seven logging typers — including two remote and five local Teletype Corp. Datospeed 40s.

There are also two IBM 1827/28 data control units, two NAS separate channel magnetic tape controllers, four NAS 7420-88 magnetic tape units and a 2,000 line/min IBM 3211 printer.

In addition, the configuration includes an IBM 2501 card reader, IBM 1442 card reader and punch unit, a 13,000 line/min Datagraphix, Inc. Autocom II microfilm output printer and a Datagraphix 73 microfilm output duplicator.

Three Genesis One Computer Corp. G77 display station remote terminal units round out the installation.

Member systems of the New York Power Pool are Central Hudson Gas & Electric Corp., Consolidated Edison Co. of New York, Inc., Long Island Lighting Co., New York State Electric & Gas Corp. and Niagara Mohawk Power Corp.

Also participating are Orange and Rockland Utilities, Inc., the Power Authority of the State of New York and Rochester Gas and Electric Corp.

Digital Plotters Geared For Drafting, Surveying

AUSTIN, Texas — A series of microprocessor-based digital plotters designed for such applications as drafting and surveying has been introduced by Houston Instrument, a division of Bausch & Lomb.

The CPS 14/ 15 family includes plotters available in widths from 22 in. to 34 in., and each system accepts data from either a standard RS-232C or 20mA loop current data source. Standard features include four-pen plotting capability and a maximum of 172 firmware-generated symbols containing both upper- and lowercase letters, Writing speeds of 10- or 15 in./sec are offered, and a thumb wheel selector allows the plot size to be scaled up to nine times its original size. Drawings can be produced in sizes varying from 8.5 in. by 11 in. to 22 in. by 34 in. Prices for the CPS 14/15 series range from $9,950 to $13,450. The plotters have a 30-day availability from Houston Instrument, One Houston Sq., Austin, Texas 78753.

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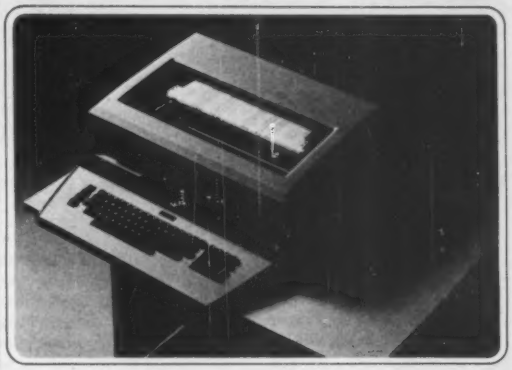

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OCR Scanner Takes Up to Eight Resident Fonts

TETERBORO, N.J. — An optical character recognition (OCR) scanner with up to eight resident type fonts and the ability to scan degraded text has been introduced by Compuscan, Inc.

The Alphaword III features the proprietary Linescan technology, which reportedly reduces moving parts while improving accuracy, speed, reliability and ease of use.

The unit is said to allow type fonts that have not previously been available on word processing or OCR systems, such as Pica 72, Elite 72 and Prestige Pica, in addition to the standard Courier 72, Prestige Elite, Courier 12, Letter Gothic, OCRA, OCRB, Perry and others.

Alphaword III also recognizes and outputs underlined words and phrases and scans text typed single-spaced, space-and-a-half and double-spaced at 120 char./sec or over 240 page/hour with a character substitution rate lower than one in 300,000 characters, according to the firm.

User-customized format instructions are loaded using a microcassette tape system. The unit provides for output to as many as five user devices including word processors, remote computers or communications modems, a company spokesman said.

Original text is introduced into the Alphaword III by means of a vacuum-fed paper handling mechanism and moves past an electronic "window" for scanning at six line/in., the spokesman explained.

The read head, consisting of a 1728 element CCD chip, "reads" an entire line at a time, eliminating any need for further mechanical movement, the spokesman claimed. Up to 50 sheets measuring 8.5 in. by 14 in. or less can be accommodated.

Self-Test Diagnostics

Self-test diagnostics are standard within the Alphaword III, permitting the user to check all the system's electronic cards and in some cases to identify problems to the chip level, the spokesman said. The user can also check out such features as the display, switches, lights and keys.

Other features include a full keyboard, 32-position LED display to isolate questionable or "best-guess" characters, a window for direct viewing of the actual scanned line and a double-sheet-feed detect alarm.

The system, including one resident type font and one interface, costs less than $30,000 with delivery in eight to 10 weeks. Each additional type font costs approximately $3,000, as does each additional interface.

Compuscan is located at 900 Huyler St., Teterboro, N.J. 07608.

Solid-State Switch System Fits DDP Needs

NORWALK, Conn. — A peripheral switching system that is reportedly priced "approximately 25% lower than similar-sized systems of other manufacturers" has been introduced by Data/Switch Corp. here.

The CPS-1000/E series was designed to meet the requirements for switching and control of distributed data processing (DDP) networks and large multiple-processor installations. It works with IBM systems, including the IBM 3880 disk subsystem, and IBM plug-compatible systems, according to Richard Green, president.

Available in 50 matrix sizes, ranging from 2 channels by 2 peripheral units to 12 channels by 24 peripheral units, the E series features three redundant power systems, battery backup and dual control systems. Optional microprocessor control is also offered.

The CPS-1000/E is priced from $10,000 to $265,000, and delivery time is quoted at 60 days by Data/Switch Corp. at Landmark Sq., Norwalk, Conn. 06851.

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Power Supplies Fit MPUs

PHOENIX — A series of 400W switching power supplies reportedly designed for users of microprocessors, small computers and other equipment in an environment where size is a consideration has been introduced by Motorola Semiconductor Products, Inc. here.

The family consists of six models: EPS1901, 1902 and 1903 and what the company designated as F versions of these devices.

All models feature soft-start circuitry to eliminate voltage overshoot and to limit in-rush current, overvoltage protection with automatic reset and remote turn-on and turn-off. The cabinets measure 8 in. wide by 5 in. high by 11 in. long and weigh less than 13 lbs, according to the company.

The F versions include a built-in electromagnetic interference (EMI) filter to limit EMI in accordance with the VDE 0871/6.78 Curve A specification.

Prices range from $450 to $630 for 50- to 99-unit quantities and the products are immediately available. Motorola can be reached through P.O. Box 20923, Phoenix, Arix. 85038.

Bits & Pieces

Uppster Offers Printers

HAUPPAUGE, N.Y. — Uppster Corp. here has acquired the rights to a nonimpact printer line that combines a solid-state light system with a photosemiconductor.

The SSL series of printers covers a speed range of 4,500 line/min to 22,500 line/min with an imaging resolution of 300 dot/in. horizontally and 240 dot/in. vertically. Line spacing is 6-, 8- or 12 line/in., and printing can be done at 10-, 12- or 15 char./in.

The company plans to have prototypes available in the third quarter of 1980. The price is estimated at below $75,000 by Uppster Corp., 125 Marcus Blvd., Hauppauge, N.Y. 11787.

Belgian Diskette Head Cleaner Available in U.S.

CLEVELAND — The CCL 140 diskette head cleaner, produced under the Compuclean label by Chemimetal S.A. in Belgium, is being distributed by Computer Resources, Inc. here.

The diskette is inserted into the drive in the same way as a floppy disk. The company claims that the disk is clean within 30 seconds.

Four diskette models are available in two sizes. The 140 and 140-1 are 8-in. diskettes, and the 1400 and 1400-1 measure 5.25 in.

The head cleaners are sold in mailing units of three diskettes for $75. Computer Resources, Inc. is at 4650 W. 160th, Cleveland, Ohio 44135.

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At Oil and Gas Firm

Mini Gives Investors Itemized Reports

Special to CW

DALLAS — Aided by a minicomptuer-based adviser, clients of an oil and gas operating company here decide for themselves whether the firm is effectively managing their investments.

"The more detailed and accurate information we give interest owners about how well their investments are doing in the 20 to 25 oil and gas leases that we operate, the easier it is for them to evaluate our performance," according to Janie Douglass, financial vice-president of Northwest Oil Co.

Since installing an NCR Corp. 8230 minicomputer two years ago, the company has been providing individual interest owners with detailed monthly statements itemizing costs for drilling, engineering and various other overhead costs for their oil and gas tracts. In all, the company handles around $3 million annually in interest owners' funds.

Prior to installing the computer system, the company was able to provide only manually prepared monthly reports with far less breakdown of expenditures at a much greater cost in personnel time, Douglass explained.

"Because of our rising dollar transaction volume, it became obvious that it would be increasingly difficult to keep pace with the compiling of even that basic account summary information," she said..

The 8230 is used for all basic accounting, including ledger, accounts payable and recievable and joint interest billings. It is also used to generate the detailed account reports for interest-owners as a by-product of these accounting functions.

Updating Reports

Information is entered into computer memory via an on-line CRT terminal. "For example, when we enter a drilling expense for a specific well we are automatically telling the computer what it needs to know to update the account reports for everyone who has an interest in that well," Douglass stated.

Once it is in memory, data can be retrieved

(Continued on Page 68)

Janie Douglass, financial vice-president of Northwest Oil, said the NCR 8230 minicomputer is used for all accounting and information management functions.

Printer Tickets Vermont Ski Resort Visitors

Special to CW

KILLINGTON, Vt. — Even without snow, Killington Ski Resort's minicomputer-based ticket printing system is working a full-time job.

During the summer, the resort's ski lifts are used to provide scenic rides for tourists and to transport visitors to a mountaintop restaurant. And thanks to man-made snow, the official ski season usually extends through May.

The ticketing system consists of an IBM Series/1 minicomputer and a series of Dataroyal, Inc. dot matrix printers. As skiers or summertime visitors arrive each day, the Model 7206 printers, located strategically throughout the resort, print the necessary lift tickets. The printers are interfaced into the Series/1 through a CRT keyboard terminal that operates serially over two- and four-wire cables from each of the remote locations, according to Dave Langlois, Killington's ticket sales supervisor and the person responsible for pulling the system together last October.

"It produces plenty of human-readable code," Langlois said, describing the benefits of the computer-based system. "It also gives us the flexibility to change prices" and "saves a lot of money on ticket stock."

Before Killington put in the IBM and Dataroyal installation, the resort had to print a

(Continued on Page 68)

Cado Unveils Turnkey

TORRANCE, Calif. — Cado Systems Corp. has introduced a turnkey small business computer system designed to compete with the IBM 5120 and other unbundled desktop machines.

The Cado Computer-Aided Tutor (CAT) is a completely bundled system that includes 32K bytes of random-access memory; two dual-density diskette drives, each capable of storing 620,000 bytes; a CRT and keyboard; and a 55 char./sec matrix printer. The system also has six financial accounting software packages aimed at the small business user, a document-oriented word processing package, seven tutorial diskettes and the firm's Just Ask II inquiry and reporting software.

Designed for the first-time user, the CAT system's inquiry and reporting software interprets English-language inquiries, sorts lists and compares information in the data base according to the user's request. Reports can be generated in the form of tables, bar charts or summary totals.

The system is priced at $13,990, which is a few hundred dollars more than an IBM 5120 without software, the spokesman claimed.

The small business system will be marketed through authorized office products dealers. Cado Systems is at 2771 Toledo St., Torrance, Calif. 90503.

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Basic Four Unveils Upgrades

SANTA ANA, Calif. — Basic Four Corp. recently announced a number of enhancements and upgrades for its small business computer line, including the extension of its Dataword II word and data processing software throughout its systems family.

The entry-level System 200 has been enhanced to support up to four display terminals. Previously, the system would support a maximum of two terminals. Also announced, the System 410 has been upgraded to handle a greater disk storage capacity. The system can now accommodate a minimum of 14M bytes of disk storage and a maximum of 58M bytes. The previous maximum was 42M bytes.

The Systems 610 and 730 have been upgraded with greater maximum memory. System 610 maximum memory is now 256K- bytes, up from 192K bytes; and System 730 memory has been doubled, from 256K- to 512K bytes. Additionally, disk storage for the System 730 doubled, from 300M- to 600M bytes, the spokesman said.

Finally, the California-based company announced that its Dataword II enhancement for concurrent word and data processing would now be available throughout its systems line. The option costs less than $10,000.

Additional information and specifications on Basic Four's announcements may be obtained from the firm through P.O. Box C-11921, Santa Ana, Calif. 92711.

Printer Tickets Ski Resort Visitors

(Continued from Page 67)

different type of ticket for each different type of customer — daily, weekly and so on. Because there are at least a dozen different customer types, that meant stocking a wide variety of tickets. Employees who had to dig out the appropriate ticket and then validate it faced a tedious chore, while the lines of skiers grew longer.

The Dataroyal printers were able to solve this problem, Langlois said. Unlike conventional printers under dedicated microprocessor control — which require different printers for different printing applications — the Dataroyal IPS-7000 series uses microcomputers that can readily be reconfigured through firmware changes. As a result, a single system can function as a variable character printer, bar code printer, label printer, report printer and, with the use of the CRT keyboard terminal, as a data entry workstation.

In the Killington installation, the Model 7206, operating at 150 char./sec, was chosen because its RS-232C interface permitted serial operation over the long distances required for a ski resort. A parallel interface would have restricted these distances to such a degree that the system would not have worked.

Langlois estimated that each printer can turn out 14 tickets each minute and that even this rate can be increased through software changes.

An important feature shared by the printers is an ability to print characters of variable size, Langlois said. This is a key factor for any recreation installation that needs to print tickets or passes with characters large enough to be visible to attendants from a distance while continuing to print reports in normal print sizes as well. The Killington resort prints its ski-lift tickets in characters 15/16-in. high, but the Dataroyal IPS-7000 series dot matrix printers can print characters as high as 10 in.

Expected Uses

As Langlois sees it, there seem to be few limits to the types of printing jobs the unit can do.

In this application, Killington prints only lift tickets and daily attendance reports, but with software changes the same system could be used to print labels and handle a variety of accounting tasks, including statements, billing, payroll and checks.

As the system is refined, Langlois expects to speed the checking-in process even further. This is the big financial payoff because the faster a resort can get its customers through the gate, the more money it can make. However, "software is the key," he observed.

Mini Details Investments

(Continued from Page 67)

either by on-line inquiry via the CRT terminal or by printing hard-copy reports. "The key to the data processing system is that everything is always as current as the last information entered," she noted.

Besides keeping interest owners better informed about their investments, the expanded reports help them to plan their own financial management by providing information needed for preparing tax reports.

Many potential users visit the Dallas office to see the computer in use, and there has been increased interaction and confidence between the company and its interest owners. "I believe we are also doing a better job for individuals since we are better able to monitor and control accounts," she added.

In addition, with government regulatory control of the industry increasing, the interactive DP system has allowed the company to answer questions faster and more accurately.

System Selection

Northwest approached the selection and installation of the DP system guardedly. "We didn't have anyone on staff with in-depth data processing experience," Douglass pointed out, "so we were particularly careful in our selection of both equipment and software."

The company solicited and carefully evaluated presentations from 10 vendors. Cost and software and maintenance support were key factors in narrowing the field. "We didn't want to pioneer so we spoke to people at companies that we installed, and the Imos III operating software had solid track records for administering oil and gas well lease accounting in our geographic area."

Growth Plans

Another factor was the expandability of the DP system. "Growth is important to us, but not for its own sake; we are interested in growth in the right directions," Douglass continued.

"For example, we are more interested in developing existing leases than in acquiring new ones. Drilling deeper is becoming more and more economically feasible now that competition from foreign oil is escalating the price-per-barrel in the U.S. We feel we could grow considerably and still stay with this computer."

Applications slated for the future include lease analysis to better assess lease performance, analyses of cash liquidity to ensure maximum investment of earnings and computations required under the Windfall Profits Tax Act.

The NCR 8230 was designed for expansion along a logical migration path. "We could add up to four more on-line CRTs with the current system," Douglass noted.

"However, that isn't a requirement we are likely to face soon. Just by adding one on-line terminal, we could dedicate one to joint-interest billing and the other to lease analysis. And these functions could be done simultaneously," he concluded.

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DEC RX02-Compatible Memory System Debuts

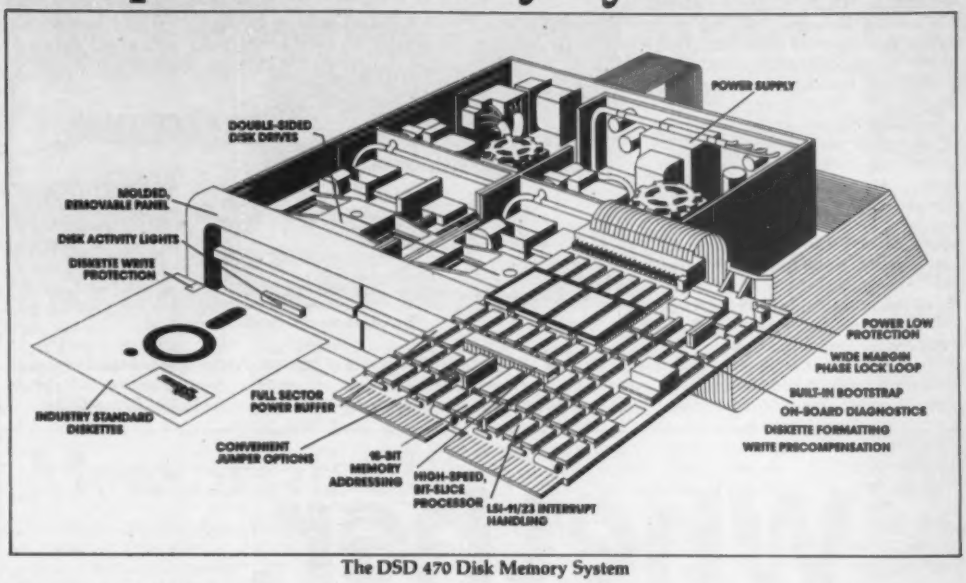
SANTA CLARA, Calif. — A double-sided, double-density Digital Equipment Corp. RX02-compatible flexible disk memory system has been announced by Data Systems Design, Inc. (DSD).

The DSD 470 is the firm's second DEC-compatible flexible disk system and is said to offer double the storage capacity of DEC's RX02 disk device. The system is hardware-, software- and media-compatible with DEC's LSI-11 CPUs and also provides LSI-11/23 users with multiple-level interrupt support, a spokesman claimed.

The 470 reads and writes on both sides of industry-standard 8-in. diskettes for a formatted data capacity of 1M byte per diskette, or 2M bytes of on-line storage, he added.

The DSD disk system includes such user-oriented features as a built-in hardware bootstrap and on-board diagnostics. The diagnostics are actually a series of microprogrammed user-selectable routines that verify proper operation of the disk system, debug to the chip level and provide detailed status reports. These routines can be used to perform incoming inspections, on-site service and scanning of suspect diskettes, the spokesman stated.

The 470 costs $4,295; OEM discounts are also available, the spokesman noted from DSD at 3130 Coronado Drive, Santa Clara, Calif. 95051.



The DSD 470 Disk Memory System

Tape Formatter Offers Control Of Four Drives

GARDEN GROVE, Calif. — Perkin-Elmer Corp.'s Memory Products Division has announced an IBM Ansi-compatible embedded magnetic tape formatter that is said to let a single controller manage up to four tape drives.

The Model 700 consists of a printed circuit board that mounts in the rear of the tape drive unit. The device operates at data densities of 1,600 bit/in. in a phase-encoded mode and 800 bit/in. in NRZI. It also provides all logic necessary for writing and reading in either phase-encoded or NRZI formats. Models are available for use with NRZI, phase-encoded or dual-density nine-track tape drives, a spokesman stated.

Under control of a microprogram, the 700 automatically performs all tape drive operations, including tape motion control, preamble and postamble generation and checking and file mark generation. All critical clock and delay times are reportedly derived from a crystal-controlled oscillator. In addition, no single-shot multivibrators are used, nor are calibration or potentiometer adjustments required by the user.

As stated before, the device can handle up to four drives, but when daisy-chained with another Model 700 it can control up to four magnetic tape transports.

The formatter costs $2,138 in its dual-density version. Perkin-Elmer's Memory Products Division is located at 7301 Orangewood Ave., Garden Grove, Calif. 92641.

Rack-Mountable System Based on LSI-11

NATICK, Mass. — A rack-mountable computer system featuring a Digital Equipment Corp. processor, fully-compatible DEC software and an RX02-equivalent dual floppy disk system has been unveiled by Charles River Data Systems, Inc. (CRDS).

The system includes an LSI-11/2 or 11/23 processor with from 32K to 128K words of memory. The basic set-up has the dual floppy disk system, a serial interface, an eight-slot backplane and a 21M-byte Winchester fixed-disk drive. The firm's MF-211 floppy disk drive is functionally identical in operation to DEC's 11VO3L and is software- and media-compatible with DEC's RX02 floppy disk system. In addition, the drive is totally instruction set-compatible with the RX02 system.

The HD-11 14-in. Winchester drive, supplied by Shugart Associates, Inc., is compatible with both the LSI-11/2 and -11/23 processors and is software-equivalent to four RL-01 disk drives, the spokesman claimed.

The complete system sells for less than $16,000 in its basic configuration from the company at 4 Tech Circle, Natick, Mass. 01760.

Memory System Fits TRS-80s, Apple MPUs

GOLETA, Calif. — Lobo Drives, International, has introduced a dual fixed and floppy disk memory system for Apple Computer, Inc.'s Apple and Radio Shack's TRS-80 Model I microcomputers.

The Model 1850 consists of an 8-in. floppy disk drive and an 8-in. fixed Winchester drive, housed in the same cabinet. The two drives share the same power supply and disk controller, with the floppy disk acting as a backup medium for the fixed-disk drive.

The floppy disk unit is the Lobo Model 850 and is available in a maximum configuration of 1.6M bytes. The Winchester disk unit is the firm's Model 1000 and comes in either a 5M- or 10M-byte capacity. The unit's disk controller and interface can control up to two Model 1850 dual-drive systems. The entire disk device is software-compatible with most TRS-80 and Apple disk operating systems.

Prices for the disk drives range from $3,495 for a 5M-byte fixed Winchester disk, dual-chassis and power supply to $4,695 for a 10M-byte fixed-disk and a double-density floppy.

Lobo Drives is located at 935 Camino Del Sur, Goleta, Calif. 93017.

Computerworld is pleased to announce the second China Trade Mission to the People's Republic of China.

This official visit, sponsored by the Fourth Ministry Machine Building, will be held from October 3—October 17, 1980 in Peking and Shanghai.

A select group of computer executives will be chosen to give technical seminars on *Micro and Personal Computers*.

The Chinese market presently has only 1,500 installed comters for a population of over 950 million people. The U.S. Commerce Department has approved the sale of computers and communication equipment.

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WP System Features Full-Screen CRT

BEVERLY HILLS, Calif. — Alpha Professional Systems, Inc. has unveiled a desktop word processing (WP) system that includes a full-screen CRT terminal and two double-density diskette drives.

The Alphasprint system includes 64K bytes of main memory, a 45K-byte display buffer, a high-resolution 12-in. CRT and a diskette drive capable of storing up to 200 pages of text. The system's IBM Selectric II-type keyboard has 72 character and function keys and a full numeric keypad.

In addition, the system's Pegasus operating system allows optional communications, word processing file merge and a DP capability. Applications software is available as well as Digital Research, Inc.'s CP/M, and Basic, Fortran, Cobol and Pascal programming languages.

The Alphasprint System

The Alphasprint package costs $7,990. Alpha Professional Systems is located at Suite 518, 9465 Wilshire Blvd., Beverly Hills, Calif. 90212.

Microtech Offers Turnkey

COSTA MESA, Calif. — Microtech Business Systems has unveiled a turnkey small business computer system capable of executing instructions twice as fast as a similar system introduced by the firm earlier this year.

The System 200 Business Information System is an enhanced version of a previous System 200 machine and incorporates a CPU that is said to be capable of processing instructions in billionths of a second. The package includes a 10M-char. hard disk memory storage unit, a four-port multiplexer for interfacing with I/O devices, a high-speed bidirectional matrix printer, an interactive CRT terminal and system software.

The business system uses the Iris operating system and is able to perform simultaneous operations of such tasks as word processing, interactive project control and the firm's business management system software programs.

The System 200 costs $27,500 from the company at Suite 108, 3176 Pullman St., Costa Mesa, Calif. 92626.

TI Introduces 16-Bit CPU

HOUSTON — Texas Instruments, Inc. has introduced a high-performance CPU module that is said to be three-and-a-half times more powerful than the firm's earlier TM990/100 or TM990/101 single-board computers.

The TM990/1481 is a general-purpose 16-bit CPU consisting of two modules. One module is a processor designed with TI's SN74S481 bit-slice processor, which contains the CPU's major operating registers; the second module is a controller, containing the control memory and microinstructions that emulate the TMS9900 instruction set and implement additional instructions that reportedly enhance integer and floating-point arithmetic.

The whole device uses the same memory-to-memory architecture as other TM990 CPUs, TI said.

The controller portion of the package also contains the instruction register, clock control logic, RS-232C serial communications controller and a memory-speed delay logic that allows the device to operate with different types of memory boards.

With 94 distinct instructions, the TM990/1481 is said to have the power of a minicomputer and it is software-compatible with TI's TM990 and TM9900 CPU families.

In single-unit quantities, the CPU costs $5,500. TI can be reached through P.O. Box 1443 M/S 6404, Houston, Texas 77001.

Whether, When and How.

A look at Distributed Data Processing in our July 28th Special Report.

The ever increasing cost of communication and the availability of better hardware for less is making distributed data processing a cost-efficient alternative, but:

- When does an organization change over to a DDP network?
- How can the change take place economically and with a minimum of disruption to the organization?
- What are the potential drawbacks of having more intelligence and autonomy in the field?
- What kind of security is there for data in a distributed database?

Produced by Computerworld's Editor E. Drake Lundell, Jr. and Systems Editor Rita Shoor, this Special Report will address these questions with tutorials and application stories. Plus, there'll be a discussion of the impact DDP is having today on the internal operations of large organizations.

If you're a user who watches the trends, you'll want to have the most up-to-date information about DDP and you'll find it in our July 28th report. Closing date is July 11th.

And if you're marketing products or services in the DP field, you'll want to make sure your ad is there. Contact your Computerworld salesman, or call Frank Collins at (617) 879-0700.

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Although Services Industry Grew 22%

Profit Margins Dip in DP Services Area

By Marcia Blumenthal
CW Staff

NEW YORK — Although the computer services industry racked up an impressive 22% growth rate last year, pretax profit margins were squeezed, dropping from about 9.7% in 1978 to 9.1% last year.

Despite the projection that the recession will slow growth in the services industry by 25% this year, vendors are more concerned about the spector of inflation and the shortage of skilled people than they are about a recession. Even the prospect of IBM's imminent reentry into the services business is expected to have a negligible impact on the industry.

These were some of the conclusions presented at the seventh annual financial analysts' meeting sponsored by the Association of Data Processing Service Organizations, Inc. (Adapso) here recently.

On the positive side, service industry vendors see the proliferation of terminals at user sites and the implementation of distributed DP (DDP) systems fueling opportunities, Peter Cunningham told some 200 analysts and vendors attending the meeting. Cunningham is president of Input, Inc., a California-based research firm that performs an annual industry study for Adapso.

Each terminal located in a DP installation becomes an outlet for a computer services firm, Cunningham noted. With DDP, most applications and systems are far more complex than standard business applications, often requiring the expertise of professional service firms.

Three-Segment Industry

Comprised of 4,300 U.S. companies, the services industry consists of three distinct segments — processing, software and professional services firms. The industry is not dominated by any single firm; the eight largest firms together control only 20% of the

(Continued on Page 73)

Acquisitions Under Study

NEW YORK — With no slowdown in sight for mergers and acquisitions in the computer services industry, the Association of Data Processing Service Organizations, Inc. has commissioned Broadview Associates to develop a statistical indicator of mergers and acquisitions.

Last year, Broadview Associates tracked 107 mergers worth $671 million in the service industry. Since 1975, the number of acquisitions of computer service firms has shown a 168% increase, making it the most acquisition-prone industry.

Federal DP: More Small CPUs

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Small and medium-size computers continue to make inroads into the federal DP inventory at the expense of larger systems, according to the General Services Administration (GSA).

Statistics compiled by GSA's Automated Data Telecommunications Service (ADTS) show that of the 857 new mainframes acquired by the government during fiscal 1979, 676 were valued at less than $200,000.

In line with that trend, of the 14,333 CPUs in the federal inventory as of last Sept. 30 (up from 12,190 the previous year), 3,656 were manufactured by Digital Equipment Corp.

DEC was the major provider of federal mainframes, accounting for 25.5% of units installed. Univac was second with 12.4% (1,778 units), down from 14.4% in 1978, and IBM was third with 9%, representing 1,284 machines.

While IBM provided 105 additional units to federal agencies during 1979, its overall share of the government inventory decreased almost one percentage point, continuing a trend that has seen the firm's share of the inventory fall steadily from 42.3% in 1965.

But IBM components still account for more federal dollars than those of any single rival vendor. ADTS listed IBM equipment worth $1.457 billion out of a total $5.402 billion of leased and purchased government DP components.

Order of Representation

The GSA annual statistical survey found 10,551 DP systems in federal use comprising the 14,333 CPUs. Figures for 1978 showed 9,299 computer systems in the government. Following DEC, Univac and IBM, the order of company representation was: Hewlett-Packard Co. and Data General Corp., each with approximately 7.5% of the total for just over 1,000 mainframes each; and Honeywell, Inc. with 6.3%, or 896 machines.

(Continued on Page 74)

IBM Opens Government Semi Facility

By Jake Kirchner
CW Washington Bureau

MANASSAS, Va. — A semiconductor design and manufacturing facility devoted to space and defense applications has been opened here by the IBM Federal Systems Division (FSD).

The purpose of the facility is to develop for government use integrated circuits not commercially available because of the peculiar requirements of defense and space systems, according to IBM.

Commercial very large scale integration (VLSI) technology has not been fully applied to these systems because of "the hostile conditions under which the equipment must operate," according to Ed Spall, manager of the FSD Advanced Development Program, explaining the need for a chip design, fabrication and testing center "dedicated solely

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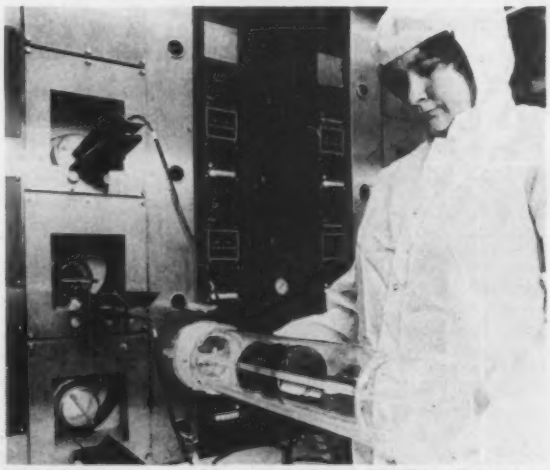

IBM Manassas process line operator Janice Van Diver prepares to load a glass cylinder containing semiconductor wafers into an oven for processing.

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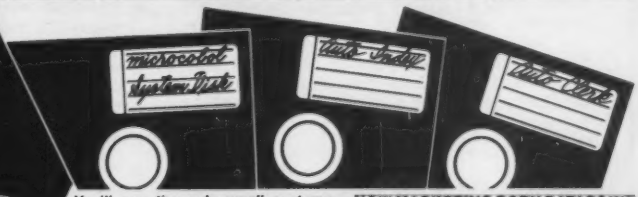

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Retail Automation Market Seen Peaking in 1982

SAN JOSE, Calif. — Electronic cash register (ECR) and point-of-sale (POS) terminal sales will reach $941 million in 1982 but will dip to $933 million in 1983, according to an analysis by Creative Strategies International (CSI).

While annual shipments of lower level terminals will parallel the industry trends, the more sophisticated ECRs will lose market share, the report indicated.

POS sales to smaller stores and companies show the best growth market as better quality software and solutions to operational and support problems for small business computers are developed, CSI said.

By 1982, this trend will result in low-cost POS terminals displacing present cash register deliveries with both IBM and Data Terminal Systems, Inc. (DTS) challenging NCR Corp. for leadership in the market, CSI predicted.

The change in the cash register from electromechanical to electronic has enlarged the field of suppliers from fewer than 10 in 1970 to more than 30 now. NCR, the industry leader, has dropped in market share of total units from 40% in 1971 to just over 20% in 1978, but it has maintained a major share of the revenues because of its concentration on the more profitable systems-oriented machines.

Since more than 80% of the major department stores have converted to ECRs, more than 50% of the supermarkets are electronic and about 30% of the fast food outlets have converted, the next major market for POS equipment will be the chains of small nonfood specialty stores, and that market will grow more than 300% from 1978 to 1980, according to the report.

After modest growth in 1979, POS terminal deliveries will increase in 1980 to peak at 150,000 units in 1982 and 1983. At that time, the traditional markets will be approaching saturation levels and replacement buying is expected to begin.

Over the last two years, deliveries of POS terminals to smaller stores were less than expected because of the inability of several manufacturers — especially NCR — to make expected deliveries. New product announcements by NCR and IBM also caused a large number of orders to be changed, the report noted.

Deliveries of sophisticated ECRs are estimated to have peaked at approximately 130,000 in 1979 and are expected to decline to an annual level of 100,000 as the units grow more similar to the POS terminal. Basic-model ECR shipments will climb to 150,000 units in 1981 and 1982 as the old mechanical equipment is replaced.

Wands, Scanners

Optical character reader (OCR) wands and Universal Product Code (UPC) scanners will emerge as important market factors, the report noted. Although the number of OCR hand-held wand installations decreased slightly in 1978, the number of UPC scanners installed increased by more than 350%.

In the future, reliability and serviceability will improve and more versatile software will develop. The software for data collection and transmission of data from POS terminals and the subsequent processing of the data will become very important factors in the sale of the equipment to the smaller stores and chains, CSI said.

CSI sees the market share of various manufacturers shifting. NCR, the leader, will retain that position, but will be challenged in POS terminal deliveries by IBM in 1980. DTS will also challenge NCR in total ECR deliveries by 1981, according to the market research firm.

IBM will emerge in the second position in terms of the installed base of POS terminals in 1981. Other manufacturers may enter the market either by acquisition or by development, and they will focus on POS terminals, aiming at capturing a share of the small business computer market in retailing, according to the report. U.S. manufacturers may also eventually face competition from Japan in markets other than the low-end ECR area, which is already dominated by Japanese imports.

The key for NCR and its competitors will be their ability to develop and support the specialized software required by smaller stores who will begin entering the POS market, CSI asserted.

The CSI report "Retail Automation to 1983" examines U.S. markets and provides forecasts in units and dollars for the various market segments. Important technology trends, pricing and developing markets are also covered in the report, which sells for $1,195 from CSI at 4340 Stevens Creek Blvd., Suite 275, San Jose, Calif. 95129.

Intel Vice-President Noyce Named to Science Academy

SANTA CLARA, Calif. — Dr. Robert N. Noyce, vice-chairman of Intel Corp., has been elected to membership in the National Academy of Sciences.

Noyce is one of 59 scientists recently elected to the academy at its 117th annual meeting. Although the academy is not a government agency, it serves as an advisory body to the federal government for science and technology.

Noyce is co-inventor of the integrated circuit. After receiving his Ph.D. degree in physical electronics from MIT in 1953, Noyce joined Shockley Semiconductor Laboratory in Palo Alto, Calif. Later he helped found Fairchild Semiconductor, now Fairchild Camera and Instrument Corp. In 1968, Noyce left Fairchild to help establish Intel Corp.

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IBM Opens Federal Semi Facility

(Continued from Page 71)

to solving government problems."

Increased temperature operating ranges, higher reliability and redundancy requirements typically characterize military electronics systems and their components, Al Bracco, manager of advanced technology at the FSD site here explained. He added that the small number of specialized integrated circuits needed in defense systems also hinder commercial development of military components.

The advanced chip development center, inaugurated May 12, is located in the 485-acre FSD facility here. The 13,000-square-foot center, expected to be fully operational by mid-summer, has approximately 130 employees.

Work at the semiconductor lab will include IBM's participation in the government's Very High Speed Integrated Circuit (VHSIC) program. IBM is one of nine contractors in the initial stage of examining ways of applying state-of-the-art chip technology to military uses.

Aimed at 20 Systems

The Defense Department project is directed at 20 specific military systems and will eventually require contractors to design and produce integrated circuits of .5 micron width. Currently the Manassas facility is working with chips with a resolution of 2 microns but expects to be working at the 1.25-micron level by 1983.

While the FSD is gearing up its operations here, an experimental signal processor of 15,000 gates is being produced using silicon-gate MOS technology. The chip was designed for real-time analysis of sonar, radar and similar systems produced for the government by FSD. The division is also a contractor on the National Aeronautics and Space Administration Space Shuttle project.

Bipolar and CMOS technologies are in line for future FSD projects here, and an electron (E) beam system for circuit impression will be installed next year, according to IBM officials.

The company also said the new facility will manufacture all the chips it designs here. Because of the limited runs required for most defense and space systems, larger manufacturing capabilities will not be required, IBM explained.

Standard components, which can be obtained from other sources, will not be produced here. And the company said it will incorporate chip technology from other IBM sources and sources outside the company into the specialized design and development work carried out here.

Contracts

Marubeni Electronics Co., Ltd. has awarded a contract to Tri-Data Corp. to supply floppy disk-based communications storage subsystems that will be incorporated into the Tymshare Corp. transoceanic data services network.

Modular Computer Systems, Inc. has received an order to supply Classic computer systems to the Department of Energy's Solar Energy Research Institute.

Byggeriets Realkreditfond (BRF), one of Denmark's two national mortgage credit institutions, has ordered an NCR Corp. V-8585M system valued in excess of $1 million. The new system, which includes 4M bytes of main memory and over 2.7G bytes of disk capacity, will be used for a variety of applications including BRF's on-line terminal network, which is being expanded to approximately 100 units.

Despite Lack of WP Offerings

Opel Sees IBM Leading WP-DP Industry

By Connie Winkler
CW Staff

ENDICOTT, N.Y. — IBM's lack of a cohesive line of word processing (WP) products does not mean that the company has lost control of its position in the information processing industry, IBM President John R. Opel told the New York Society of Security Analysts here recently.

Until there is a merging of data and text processing products — so that each product works with every other product — IBM will continue to be criticized on its product line, Opel said.

"We are clearly aiming all our guns to be that ideal. Our new product design will reveal more of that grand design," Opel told more than 100 analysts visiting the manufacturing site here.

The designate chief executive officer compared the current relationship between word processing and DP products to the situation prior to the introduction of the 360. At that time, IBM had many different approaches to DP including 11 computer architectures and two product divisions, he said. "I don't know of anyone who has done it all," he said about the merging of DP and WP products. "We expect to be at that position at some point."

Opel said IBM will change its way of doing business during the '80s, moving away from custom-ordered computers with thousands of features, options and models to standardized off-the-shelf offerings, which will be built in large volumes and will be easier to install and service.

The U.S. DP industry is expected to grow 15% to 20% annually and IBM "will be able to keep pace with that growth." He cited the $1.4 billion IBM spent on research and development last year and recent expansions in plant and laboratory space.

During this recession, IBM is managing with restraint — carefully staging each capital expansion program, he noted. However, there has been no backing off with regard to plant construction, nor have there been employee cutbacks.

Opel's theme of a coming change in the way IBM does business threaded through other presentations during the analysts' field trip.

There are now two worlds of DP, the high-end processors and the innovative small systems, according to F.G. "Buck" Rodgers, IBM's corporate vice president of marketing.

Paraphrasing one management theory, Rodgers acknowledged that sometimes corporations don't grow because they are living too much in the past.

"IBM is flexible," Rodgers said, referring to its ventures with Comsat General and Discovision.

Flexibility for users is what the new long-awaited interactive System/38 is all about, according to James E. Dezell Jr., vice-president for the General Systems Division's sales support. The system, which has been delayed for a year, is to be shipped, Dezell assured his audience. Within IBM, 200 System/38s are already being used, he said.

There is still a 30-month delivery wait for the System/38, but Dezell said this has not dampened customers' interest. Eventually delivery times will shorten to six to 12 months.

Profit Margins Slump in DP Services

(Continued from Page 71)

market.

During 1979, processing firms had revenues of $6.7 billion, roughly 70% of the industry's total revenues of $9.5 billion. Professional service firms ranked second with $1.5 billion, and software products companies accounted for $1.3 billion in revenues.

The industry last year created 44,000 new jobs, bringing total employment to 232,000 persons.

The smallest revenue producer, the software segment, grew by the largest amount, 30%, while processing service firms grew by 20% and professional service firms by 17%, resulting in an overall 22% growth rate for the industry.

However, the growth rate for the 32 large publicly held companies grew by 25.6% and revenues from non-European overseas countries advanced 52%.

By 1985, Input suggests the industry will increase its revenues more than threefold, reaching $30 billion. At that time, processing service firms will account for only 56.6% of revenues, while software companies will produce 26.6% of revenues, about twice the current level. Professional services will remain relatively steady at about 16%.

The growth rate predicted by the larger firms, which forecast more accurately than smaller companies, will slow this year to 19% and grow about 18% annually until 1985, Input reported.

Despite healthy revenue growth rates, last year average pretax profit margins for all firms slipped to 9.1% from 9.7% in 1978. However, for firms in the $10 million range and above, pretax margins remained steady at 10.8%, up from 10.7% the year before.

Reasons for Squeeze

Why the profit squeeze? Although inflation in part can be blamed, Richard Crandall, president of Comshare, Inc., claimed that economies derived from lower hardware costs are becoming more scant. And it is that phenomenon that is beginning to put a cramp on profits. Even a recession does not diminish profit growth, Crandall said, noting that pretax margins have climbed nearly every year, even in recessionary times.

In 1975, about 45% of a processing service firm's revenues went for hardware purchases. In 1978, those expenditures dropped to 12%. "Even if hardware prices drop further, it will not offer many economies," Crandall observed.

To alleviate the squeeze on profits, Crandall recommended that service firms automate data entry, turning this function over to the end user.

In addition, firms must standardize products to reap greater returns for software development costs. Currently, even the most basic business application package costs at least $1 million to develop, Crandall claimed.

Perhaps the most pressing need is for service vendors to fully employ telecommunications and distributed processing for automating data delivery. Crandall figured firms which take full advantage of automation should be spending about 6.9% of revenues on telecommunications.

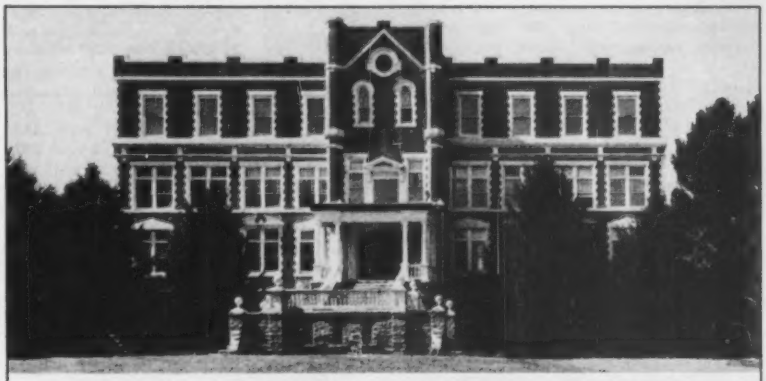
Return of Info 80 Slated For New York, Oct. 6-9

NEW YORK — The information Management Exposition & Conference, Info 80, is scheduled to return Oct. 6-9 to the New York Coliseum, where it drew record attendance last year.

Show exhibitors included more than half the companies in the Fortune 100 list, according to Clapp & Poliak, Inc. the show's producers, which also noted that 28% of the registrants were drawn from either Fortune's Double-50 list of industrial companies or from Fortune's list of nonindustrial firms.

Executives from the top 1,000 industrial firms or the top nonindustrial companies comprised 28% of the show's attendees, according to the conference management firm, and 62% of the Fortune 100 companies had representatives at the show.

Info 80 is expected to exceed last year's numbers, according to Clapp & Poliak, which can be reached at 245 Park Ave., New York, N.Y. 10017.



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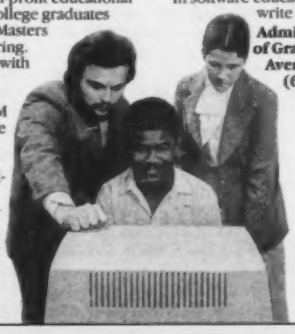

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Forms OEM Subsidiary

Holding Company to Market In-House System

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — A 20-year-old conglomerate has turned the development of its first in-house computing system into a potentially lucrative new business opportunity.

R&B Enterprises, Inc. — a holding company with interests in property management, construction and advertising — last March debuted as a computer vendor by forming a new subsidiary to build and market systems similar to the one it recently finished developing for its own personal use.

Christened R&B Information Systems, Inc., the subsidiary fits the mold of the classic OEM: it combines its own software with other vendors' hardware to form custom-built systems for very small businesses and for end users in the construction industry and property management field.

Small Business Sector

In the small business sector, the company markets a general-purpose system configured around a Point Four Data Corp. processor, which runs under the Iris operating system and emulates the Data General Corp. Nova 2 and 3.

To the Point Four hardware, the R&B subsidiary adds its own in-house-developed software, which includes application packages for doctors, lawyers, accountants, hotels, motels, restaurants and other businesses or users whose annual revenues range from $500,000 to $1 million, according to Henry Huta, company president.

For users in the construction industry and property management field, meanwhile, the firm supplies systems built around a choice of a Hewlett-Packard Co. Model 3000 Series III, 33 or 30. The main difference between the construction industry and property management systems lies in their software, Huta explained.

The construction industry system operates with Redpac/3000, R&B's version of a construction company application package that Arthur Andersen & Co., the New York City-based public accounting firm, originally developed for its time-sharing system. The property management system, by contrast, uses RPM/3000, an application package that R&B developed in-house.

Emergence as OEM

R&B's emergence as a computer industry OEM began about two years ago when the parent company decided the time had come to install its first in-house computing system. For years, the company had processed all its data offsite at an independent service bureau.

But by 1978, R&B was growing at such an accelerated pace that the service bureau could no longer satisfy the company's expanded computing needs, Huta recalled. So the search began for an alternative system.

R&B's first step in phasing out the service bureau was to hire Huta, who at the time was still working as a consultant for a local accounting firm. In his new capacity as R&B's information systems manager, Huta launched a feasibility study to decide which of the various systems options then on the market would best meet his new employer's rapidly growing computing needs.

On the hardware side, the study focused primarily on systems from four vendors — Digital Equipment Corp., Data General, HP and IBM. After six months of evaluation, Huta opted for an HP Model 3000 Series III, "partly because of HP's maintenance track record and partly because of its Image data base capability," he explained.

By far the most difficult phase of Huta's feasibility study proved to be the selection of the R&B system's software. By the time the study was completed, Huta had evaluated some 25 software vendors' offerings.

Software Development

Eighteen months and a "huge" manpower investment later, the software development project ended successfully with the installation of R&B's first fully operational, in-house computing system, Huta said.

But when the project was nearly complete and Huta could still find no evidence of a comparable system elsewhere in the market, R&B's executives began to ask themselves a question: "why let the expertise we gained during our two-year effort go to waste when we can market a version of our system to other users and in so doing recover our enormous software development costs?"

R&B's management quickly approved the idea, and so last March — almost as an afterthought — R&B Information Systems came into being.

Today, the newest of the parent company's 10 subsidiaries employs a staff of about 40. In addition to Huta, who as a boy lived for a while in a Scottish refugee camp after his family was displaced from its home during World War II, R&B Information Systems employs two Soviet computer scientists, who recently fled their homeland to escape religious persecution.

More Small CPUs in Federal Use

(Continued from Page 71)

Modular Computer Systems, Inc. (Modcomp), Control Data Corp., Burroughs Corp. and Xerox Corp. followed in descending order with 4% or less of the federal inventory. Twenty percent (2,889 units) were listed under "other" manufacturers.

ADTS divided the number of mainframes in federal use into two classifications: "general management," of which there were 9,046, and "special management" — 5,287. The first category covers business-oriented systems and the "special management" term applies to units installed in classified locations, used for process control and onboard ships and planes.

Largest Users

Of the 11 civilian agencies listed, the Department of Energy (DOE) continued to be the largest user of computer systems (CPUs plus peripherals) with a total of 2,679. The National Aeronautics and Space Administration (Nasa) was a distant second with 501 systems.

Besides accounting for more systems than other agencies, DOE and Nasa also were found to be the major users of systems configured with four or more CPUs, with Energy using 71 of these multi-CPU systems and Nasa 96.

The total number of federal DP systems was evenly divided between civilian and military agencies — 5,357 civilian to 5,194 military. Of the Department of Defense (DOD) systems, the Air Force accounted for 1,894, the Army 1,310 and the Navy 1,731. An additional 259 were listed as "other DOD."

As sellers to the military market, Univac continued to lead its competitors with 1,207 mainframes installed. DEC and IBM followed with 949 and 758, respectively. HP and Honeywell each accounted for about 575 military CPUs. Burroughs, CDC and DG each placed approximately 300 machines with the Pentagon.

The military is still using 109 Xerox CPUs, down from 115 the previous year. DOE and Nasa accounted for the bulk of the Xerox units on the civilian side of the firm's ledger with 41 and 119, respectively. Civilian agencies used a total of 188 Xerox machines, down from 193 the year before.

As vendors to the civilian agencies, DEC and DG led the pack with 2,707 and 764 units, respectively. HP, IBM, Modcomp and Univac each accounted for between 521 and 571 units.

According to the ADTS figures, federal DP systems included 59,237 storage devices, costing $1.8 billion, purchased and leased. GSA counted 74,603 I/O devices, representing $982 million in federal expenditures, and 71,482 communications terminals, worth some $371 million. Of these components, the overall ratio of leased to owned remained about two to one.

Also mirroring last year's figures, CDC, DEC, Honeywell and Univac were about even as suppliers of memory units, with between 5,000 and 6,500 installed devices each. IBM accounted for just over 8,000. IBM also led the other vendors in I/O devices, with almost 11,000 installed.

Univac, CDC and Honeywell followed in the I/O category with 6,851, 6,314 and 6,105 respectively. Burroughs accounted for 4,911 units, followed distantly by DG and Xerox with 1,171 and 1,525, respectively.

As in the 1978 figures, CDC was a major name in terminals in the government market with 9,484 but was overtaken last year by Honeywell with 9,490. Burroughs, Univac and IBM followed in order with 6,236, 4,547 and 4,192.

In total government components — CPUs and peripherals — IBM continued to be the major supplier with 55,987 pieces of equipment. CDC, Univac and DG followed IBM with 25,752, 24,461 and 22,674 units, respectively. Then came DEC with 17,826 and Burroughs with 15,758.

Other statistical findings by ADTS included the following:

- While IBM accounted for the largest dollar total of government DP equipment, with $1.457 billion, the company was followed, in rounded figures, by CDC with $754 million, Univac with $686 million, Honeywell with $534 million, Burroughs with $310 million, DEC with $241 million and Xerox with $117 million.
- HP, DG and Modcomp rounded out the list with $60 million, $38 million and $36 million, respectively, of federal components. Various "other" suppliers accounted for $1.169 billion in government components — CPUs and peripherals.
- As of last September, the federal government had $176.4 million worth of CPUs valued at less than $50,000 each; $313 million worth between $50,000 and $200,000; $308.4 million costing between $200,000 and $500,000; $395 million of $500,000 to $1.5 million units; and $750 million of CPUs worth more than $1.5 million each.
- In all, the federal government acquired 19,480 CPUs and peripherals, valued at $396 million, in fiscal 1979. Added to previous holdings, 1979 procurements brought the federal inventory to 275,035 pieces of equipment, valued as of last Sept. 30 at $5.402 billion, according to GSA.

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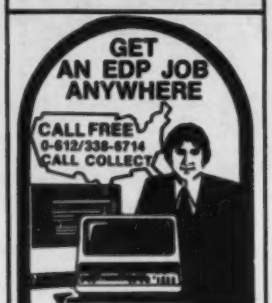

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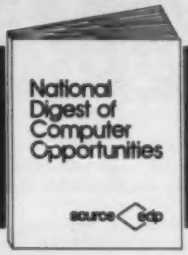

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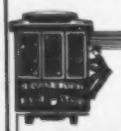

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SYSTEMS ANALYSTS

We are looking for systems analysts to design and implement sophisticated on-line banking systems.

Successful applicants would have 3-7 years programming and design experience. COCS desirable but not mandatory.

The positions will be challenging technically and require a high degree or user interface.

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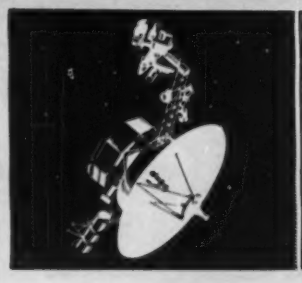

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REAL-TIME PROCESS I/O SPECIALIST

We are seeking individuals with prior experience in applying operating systems to real-time environments. You will be technically responsible for process control applications. Previous experience in the development of process control languages, real-time operating systems, and/or data acquisition and control software is essential. BSCS or EE preferred.

SENIOR SYSTEM PROCESSOR SPECIALISTS

We are seeking individuals with a minimum of 3 years' experience in the design, testing, and documentation of systems processors. Emphasis will be placed on compiler experience, especially COBOL and PASCAL compilers. BSCS or equivalent preferred.

SENIOR OPERATING SYSTEM SOFTWARE DESIGNERS

We are seeking individuals with a minimum of 3 years' experience in the design and implementation of operating system software, including a detailed understanding of computer architectures and familiarity with modern operating-system design theory. You will be responsible for designing and implementing real-time, multi-tasking operating system components. BSCS or equivalent preferred.

DIAGNOSTIC PROGRAMMERS

We are seeking hardware diagnostic development programmers. You will be responsible for developing stand-alone and on-line diagnostic software packages. Your functions will include conceptual definition, project design, debug, and implementation. BSCS or equivalent preferred.

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Send your resume and salary history in confidence to: **Mr. Richard Green, MODULAR COMPUTER SYSTEMS, INC., 1650 West McNab Road, Fort Lauderdale, Florida 33309. Or call Monday through Friday 9 AM-5 PM, 1-800-327-8997.**

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BUSINESS DATA PROCESSING INSTRUCTOR

Missoula Vocational Technical Center, an equal opportunity employer is in need of a Business Data Processing Instructor. Responsibilities will include teaching Principles of Data Processing and Data Entry courses. Eventually teaching assignments may include COBOL, RPG, BASIC and other courses related to computer programming and operation. One year work experience in data processing required with more preferred. Applicants must qualify for a Montana teaching certificate.

Teaching contracts begin September 2, 1980. The contract is 181 days with a teaching load of five (5) hours per day for two (2) quarters and six (6) hours per day for a third quarter. Time will be available prior to the beginning date for program and course familiarization.

All applications should be forwarded to **Mr. Reid Stevens, Personnel Director, 2101 Row Street, Missoula, MT 59801,** by June 30, 1980. For more information contact Mr. Gene Downey or Dennis Larum at (406) 721-1330.

FLORIDA

Our CLIENT is SEEKING a DYNAMIC INDIVIDUAL to SUPERVISE a NEW data processing DEPARTMENT LOCATED ON the ATLANTIC OCEAN in NORTH FLORIDA. SUPERVISORY EXPERIENCE, SYSTEMS DESIGN and PROGRAMMING of FINANCIAL SYSTEMS, RPG II, IBM SYSTEM 34 and a COLLEGE DEGREE are DESIRABLE. Please subit RESUME INCLUDING SALARY HISTORY or CALL:

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At Wang, we're always pushing the edge of technology. That's why we offer some of the most exciting opportunities in the business.

Right now, for example, we're working on our new VS 32-bit virtual storage computer – a multi-function, multi-user system that outperforms the IBM 370/158. The VS can handle data processing, word processing, and database management, and can support 8 languages.

The software challenge is to keep all these functions working together efficiently.

We're looking for people who can tackle this type of problem – people who aren't afraid to break new ground.

So if you'd rather lead than follow, call Wang.

For more information, contact Susan Morse, Wang Laboratories, Inc., Dept. #C616, One Industrial Avenue, Lowell, MA 01851. (617) 459-5000.

Systems Software Development.

VS/Office systems Development

Participate in the design and implementation of the "Office of the Future" on the Wang VS Computer System.

The Wang VS Computer System provides highly advanced interactive and batch data processing capabilities and hosts Wang Word Processing, the world's most popular CRT-based Word Processing. Integrated Information Systems, however, means much more than simply providing Word Processing on a computer. Highly human-engineered, interactive Document Storage & Retrieval, Calendar Management, Electronic Mail, Voice & Image Processing, Forms Management, and Data Base Query represent just some of the products either under development or to be developed.

We are looking for experienced, creative, product-oriented professionals to integrate Word Processing, Data Processing, Operating System, and Data Base technologies into advanced office automation software products. Applicants should have experience in Document Storage and Retrieval, Data Base, and/or interactive applications; a sensitivity towards human engineering; preferably, some systems programming background; and proven track record in project leadership.

VS Computer Architecture

The VS Processor Development Group is seeking computer professionals whose talents span both hardware and software disciplines. Group members will consult with VS Operating Systems, Firmware, and Data Base personnel in order to gain an in-depth understanding of the requirements of these groups regarding systems architecture. This knowledge will then be applied to the design and functional specification of system architectures and processors. Specific areas of group activity include CPU microprogramming, CPU micro-instruction set definition and specification, and close participation with the Engineering Department during the systems design and implementation process.

Applicants for these challenging, high visibility positions should have a technical degree and industry experience in the area of minicomputer or mainframe architecture design, or CPU microprogramming.

VS/Network Development/Distributed Processing

Senior Systems Programmer/Software Engineers

A number of challenging positions exist in our newly formed VS Network Development Group. If you have solid experience in the areas of systems programming and design, and can learn about new areas quickly and on your own, opportunities exist for you to participate in the design and implementation of the networking/distributed processing support for our highly successful 32 bit, virtual storage VS computer line.

The ideal candidates will be systems oriented generalists who possess a good overview of data processing - operating systems, teleprocessing, and data base management systems and who have 3-5 years systems programming experience in a vendor or consulting environment.

VS Firmware - Project Leader

If you are a design-oriented sytems development specialist who is not only comfortable with in-depth participation in hardware system architectural designs, but also experienced in development of virtual memory operating systems and other areas such as DBMS and communications, then we have a position for you.

Positions exist in development of current and future Wang Integrated Information Systems which covers both global and local designs of systems hardware architecture, microprogramming for distributed processing and operating systems integration. Interface with design engineers and systems programmers will be extensive.

VS Senior firmware systems programmers

You will be assigned project design/development responsibilities in the area of intelligent subsystems for current and future Wang computer and office systems products. You will participate in the tradeoff negotiations among hardware engineers, microprogrammers and systems programmers for optimal workload distribution using a top-down approach. You should be experienced in multi-task operating systems, data management programming and communications. Hardware design and microprocessor experiences are strong assets in these positions.

VS Firmware development

If you enjoy the challenge of working with state-of-the-art microprocessors and advanced computer peripherals while utilizing advanced systems programming techniques and you are capable of planning and implementing new systems by working with hardware engineers and other systems programmers, we have a position for you.

Positions exist in research and development of intelligent I/O subsystems, data base machines, graphic displays, voice/speech processing, image printing and data communication such as broadband coaxial links and fibre optics.

Vs Operating Systems

Keystone of Wang VS software development effort, the operating system development department has openings for experienced system programmers and software engineers in the areas of architectural specification, virtual memory management, process structuring, indexed file systems, and user and operator interfaces. Development of integrated office systems combining word processing, interactive data processing, and a complete and highly visible spooling system is underway. Intelligent clustered device support and advanced job stream control systems are being planned.

Come to an organization where individual skill and achievement is promptly rewarded by increased technical and supervisory responsibility, and where each project is significant in the development of real products which receive wide commercial use.

VS/Query Language Development

Query language development is one of the most exciting projects in our VS data base department. It will involve the integration of the most up to date knowledge in the query area (e.g. query optimization,) with the Wang "easy to use" approach.

Both senior and intermediate people are needed. The senior person should have an advanced degree in computer science (or equivalent) and significant experience in the data base/query language area or in compilers and interpreters, as well as be able to integrate recent research results into new products and have a strong interest in end user requirements.

The intermediate person will have a B.S. in computer science (or equivalent) one to three years systems programming experience, and be strongly motivated to enter into a new and challenging area of software development.

VS/Language Processors Software Tools Development

Openings exist at all levels of experience in the design, development, and support of compilers, run-time systems, and software development tools. Projects exist with openings in several areas including (but not restricted to) the following:

*PL/1	*COBOL	*RPG II
*BASIC		*FORTRAN
*Symbolic		*Run-Time System
*Performance Analysis		*Source Code Control

Our new compiler development work is based upon the use of PL/I as an implementation language and involves the development of common compiler components. Language dependent front-ends are being designed to interface to common optimization, code generation, and run-time system components. The objective is to gain maximun compatibility between languages while at the same time reduce and maintenance costs.

By design, our programming languages support common file structures, calling sequences, an innovative data base management system, forms management, and a common interactive symbolic debugger.

An MS in Computer Science or the equivalent experience is usually required. A small project team environment is emphasized and provides the opportunity for a high level of responsibility and visibility.

Specific openings include the following:

COBOL Compiler Development: We are actively enhancing and extending our ANSI 74 COBOL compiler to support DBMS, Forms Management. The development of an ANSI 80 COBOL front-end will be initiated.

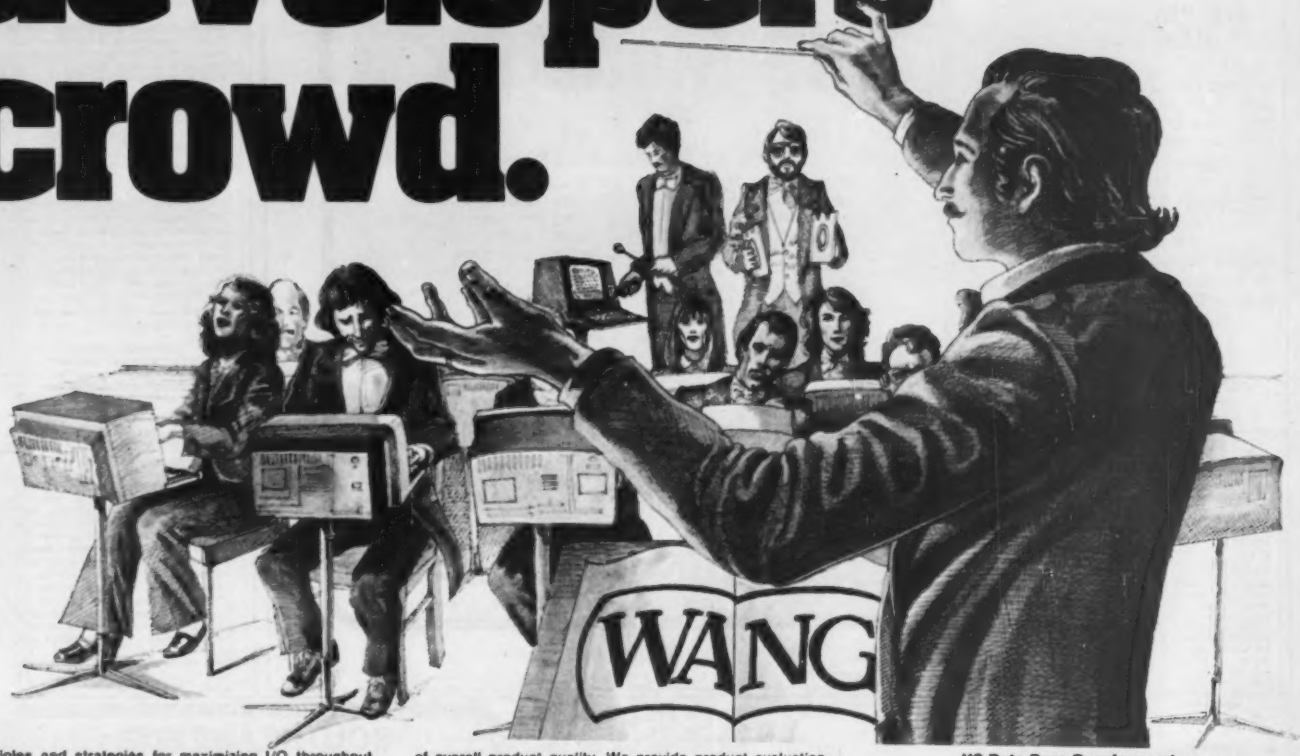
Multi-Language Code Generater Development: We are developing a common code generator and optimizer that will ultimately support compiler front-ends for multiple languages generating a common intermediate text. The support languages will include PL/I, FORTRAN-77, COBOL-80, and BASIC.

Software Tools Development: Openings exist for persons wishing to become involved in the design and development of software development tools targeted towards high-levels language applications developers. Projects include, but are not limited to, source code control systems, interactive symbolic debuggers, program synthesis, intelligent language-based editors, and performance analysis tools. We intend to continue to have the best human-engineered commercial software development environment in the business.

VS/Performance Analysis

We seek computer professionals interested in experimentation and performance analysis; operating system architects with an in-depth understanding of resource management

developers crowd.



principles and strategies for maximizing I/O throughput. You will work with the latest in performance measurement tools, including a workstation emulator for load driving, synthetic workload applications, and both hardware and software monitors. Solutions will be applied in both data processing and word processing environments.

The Performance Analysis department's raison d'etre is to assess VS performance at the system level as an integral part of the overall development effort. The goal is to quantify how resource utilization varies as a function of application environment. Emphasis is placed on global design optimization and architectural alternatives for maximizing machine efficiency. We work closely with the other development organizations, following through on our recommendations to bring enhanced products to market.

Applicants should have a technical degree, or equivalent in training and experience, and significant exposure to the problems of designing and programming high performance, interactive computer systems.

VS/System Integration

Section Manager, Internal Technical Communication

Our Advanced Computer Systems Development Center is looking for an exceptional individual to form and lead our new Internal Technical Communication Group. This group, including educators, systems programmers, and technical writers, will be responsible for all technical documentation used by our own research and development staff for working reference material and new employee training, and for communication of product strengths and capabilities to corporate product support personnel.

We're currently developing System Architecture, Operating Systems, Compilers, Database Management Systems, and Utilities for sophisticated commercial computing systems, office automation systems, and distributed DDP networks. Undigested technical information requiring formal documentation is generated at a trememdous pace.

Candidates for this challenging position must have excellent technical, managerial, and communication skills. The ideal candidate has 5-15 years systems programming experience including project leardership or managerial responsibilities, wide-ranging knowledge and understanding of industry concepts, and a demonstrated ability at written communication.

VS/System Integration

A number of challenging positions exist for experienced systems-oriented software professionals in the VS System Integration Department. Working directly in the Advanced Computer Systems Development Center on Wang's highly successful 32-bit virtual memory VS computer line, our charter is evaluation, planning, and development in support of overall product quality. We provide product evaluation analysis, documentation, inter-departmental software development plans, and specific software development as appropriate for significant improvements in functional capability, product reliability, and ease of use.

Current projects include system simplification, data-structure redundancy and recoverability, automatic performance optimization, system security, and integrated software tool environments.

Candidates for these positions should have 3-i5 years experience in systems programming, good working knowledge of state-of-the-art system software concepts, excellent communication skills, and some familiarity with the commercial EDP marketplace.

VS/Utilities

A number of challenging positions exist for systems programmers to work on interactive systems software for Wang's highly successful 32-bit virtual memory VS computer line. We're known for an exceptionally ease-to-use, functionally-rich, reliable human interface, and we're not content to stop there. Today's sophisticated software tools are tomorrow's building blocks. We're redesigning and repackaging file-oriented utilities for use with database management systems, distributed EDP networks, and office of the future environments.

We're looking for individuals of outstanding ability who take pride in the software they build, and want opportunity to use and develop tomorrow's technology today. Candidates are welcome at every experience level, from entry level to project management. MS in Computer Science or equivalent experience preferred.

VS/High-reliability System

Openings exist in an advanced-development software group which is concentrating on the design and implementation of very reliable systems. These systems make use of redundant components, data base technology, and imaginative software structures to insure higher-than-usual levels of integrity and availability. Hardware technology is driven by software requirements, and includes 8-bit, 16-bit, and 32-bit processors and multi-ported peripherals. If you have extensive experience in system engineering, operating system programming, I/O interfacing or hardware design, and can generate ideas in an environment which stresses independence and professionalism, this may be the position for you!

Our operating system development department is looking for experienced software designers and programmers familiar with up-to-date technology in the area of failure-resistant and high-availability computing systems. Data base recovery, process-state checkpointing, and redundant hardware utilization are being stressed. Experience with highly interactive commercial computers, I/O interfaces, central processor microcoding, assembler language programming, or file structures is desirable. This is an opportunity to work with considerable independence on the development of real products which are on the cutting edge of the system engineering art.

VS Data Base Development

At Wang, we see data base concepts as keys to solving a much broader set of problems than mere data retrieval and presentation. Some problem areas where data base technology are applicable include distributed processing, data base machines, transaction-based systems, networking, display and forms management, as well as integration of data processing and "office-of-the-future" product directions. Concomitant with these directions, we are committed to helping solve the software engineering problems that currently attend the use of large shared data bases through the development of very high level language interfaces for the application programmer, non-programmer, and data base designer.

At Wang, we are building state-of-the-art data dictionaries, hybrid file systems, query and data definition languages, not as an end in themselves, but as tools to help the end user solve his problems. Some of our products like ADMS, an advanced data management system with centralized data descriptions and a sophisticated recovery/restart system, have already been announced and are well on their way toward becoming products. Others like VS-DBMS, a model independent Data Base which supports both relational and navigational interfaces, are currently under design. Still others such as Query Languages, Data Base Design tools, and a Forms Management System are in the planning stages.

The following opportunities are available within the VS-Data Base Development department at Wang Laboratories:

SYSTEM PROGRAMMERS

1-3 years of experience with mini to maxi computers writing in assembler. You have been successful on OS development, Special Systems, File Systems, Utilities or Languages and are eager for a chance to learn and contribute in a new and existing area: DBMS. This area provides opportunities in the design and implementation of a novel DBMS including Query Language, Data Dictionary, and Access Method development.

SENIOR SYSTEM PROGRAMMER

3-5 years experience specializing in File System, O/I Subsystems, Access Methods, and OS interfacing. This is a challenging opportunity to play a lead role in the design of a new File System whose requirements are flexibility, modularity, high performance and reliability.

SOFTWARE TOOLS PROGRAMMER

Several years experience in the definition, design and building of software tools in a development environment. The emphasis here is on practical computer-based tools and aids ranging from the design-documentation issues, structured programming macros to test path analysis systems.

DATA BASE MACHINE PROJECT LEADER

Several years experience in Data Base system development, working preferably at the OS, I/O and firmware and hardware interface level. We are interested in a senior contributor willing to investigate several novel architectures and approaches for optimizing the Software/Hardware interface issues in a distributed data processing environment.

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DIRECTOR OF DATA PROCESSING
Salary range: $2461-$3700 per month

The Metropolitan Government of Nashville & Davidson County Tennessee is recruiting for the position, Director of Data Processing. **Minimum qualifications:** Bachelor's Degree in Business Administration or closely related area with emphasis in Data Processing and Programming from an accredited college or university plus 8 years of experience in data processing including 5 years of experience in managing a large central data processing department. Examination weights: oral examination 60%, education experience 40%. The **Personnel Dept, 224 Stahlman Bldg., Nashville, Tenn.** will accept applications/resumes for the above position starting Monday, June 9 through Friday, June 20, 1980. **Attn: Jim Lynch, Recruiter.**

MIS Manager

The Terminals Division of Perkin-Elmer, one of the country's leading high technology companies, has an immediate opening for an MIS Manager.

Overall responsibility will include directing the scheduling and operation of all production activities associated with computer processing in a manufacturing environment. You will be responsible for: a computer facility which provides both on-line and batch processing service, establishing and enforcing standards for controlling work flow, evaluation and installation of new equipment to meet constantly changing user requirements.

Candidates should have 5-7 years experience in systems design, programming or operations with 3-5 years supervisory/management experience.

We offer an excellent starting salary and comprehensive benefits program. For prompt consideration, send your resume, including salary requirements to: L. Egleston, Terminals Division, The Perkin-Elmer Corporation, 360 Route 206 South, Flanders, N.J. 07836.
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SYSTEMS MANAGER

The University of Missouri, a progressive, Big-8 institution with four campuses, has immediate openings for two Systems Managers interested in living in the heart of Missouri on the northern edge of the Ozark Mountains. Columbia, a University community of approximately 65,000, offers an unusual combination of urban and rural benefits and is an equal distance, 120 miles, from St. Louis and Kansas City.

The University is currently involved in a major effort to upgrade and expand its information processing systems, utilizing on-line and data base management technologies in a computing network environment.

Each Systems Manager will be responsible for development, implementation and maintenance of information processing systems for a specific area of the University.

Minimum Qualifications: Bachelor's degree in computer science or a related area and 6 to 8 years experience in project management, software development and information systems design. Experience in and an appreciation of both ADP and academic/research computing is desirable.

Forward resume and salary requirements before June 30, 1980, to:

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HOUSTON

SYSTEMS PROGRAMMER 32K

A major engineering/construction firm based in Houston is seeking an individual with a good background in systems programming (3+ years) and special knowledge of CICS internals or VTAM and the 3705. This is a large scale IBM environment requiring experience with OS/MVS or OS/VS11. Excellent company benefits and profit sharing plan.

MANUFACTURING SYSTEMS ANALYST 30K

This major firm is seeking individuals with a background in manufacturing and knowledge of the Univac 1100 and related software (OS-1100/DMS-1100). Any experience with UNIS a real plus. This position is a growth opportunity but requires an individual with excellent verbal and interpersonal skills. There is some travel involved.

DATA BASE SPECIALIST 33K

An individual with 3 years of experience in IMS DB/DC and knowledge of IMS utilities will be a good candidate for this position with a major oil firm. The position requires good interpersonal skills in interfacing with the user organization in this development effort.

SENIOR SYSTEMS ANALYST 32K

This position requires good COBOL experience and a business sytems background in a medium to large scale environment. The ideal candidate will also have been involved in major development efforts requiring good analytical skills. Experience with IMS in an on-line environment is a real plus. As a major oil company, this firm offers excellent benefits and compensation.

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CICS Coordinator

University of Florida

The Northeast Regional Data Center is the largest of five computer utilities servicing the State University System of Florida. It provides the data processing environment for both scientific and administrative computing on a ten megabyte hypervised MVS/VM system. CICS/VS is used to handle administrative transactions form 300+ terminals in three cities. The NERDC needs a data processing professional who can handle the demands of this rapidly expanding network. Planning and coordinating the execution of projects to expand and enhance CICS/VS services will be the primary function of this individual. These projects will address performance and function of CICS/VS and the quality and efficiency of application systems. Knowledge of CICS/VS internals will be needed to tune and modify systems services; the operational aspects (JCL, TCT, PCT, etc.) are handled by other staff. The ability to provide technical direction and evaluate application systems development efforts will be tempered by two pilot 8100 DDP projects just getting underway. Future challenges include successful implementation of ISC in an existing multi-mainframe network. Interested applicants with Bachelor's degree and three years relevant experience in sophisticated on-line information systems with expertise in design, analysis, programming & debugging of CICS application system, macro writing in IBM 370 assembler language and MVS data management design and problem determination should send complete resumes by June 27, 1980 to: **Robert L. Willits, Assistant Director, Personnel Relations, Second Floor HUB, University of Florida, Gainesville, Florida 32611.**

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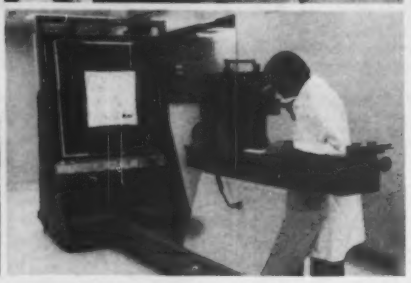

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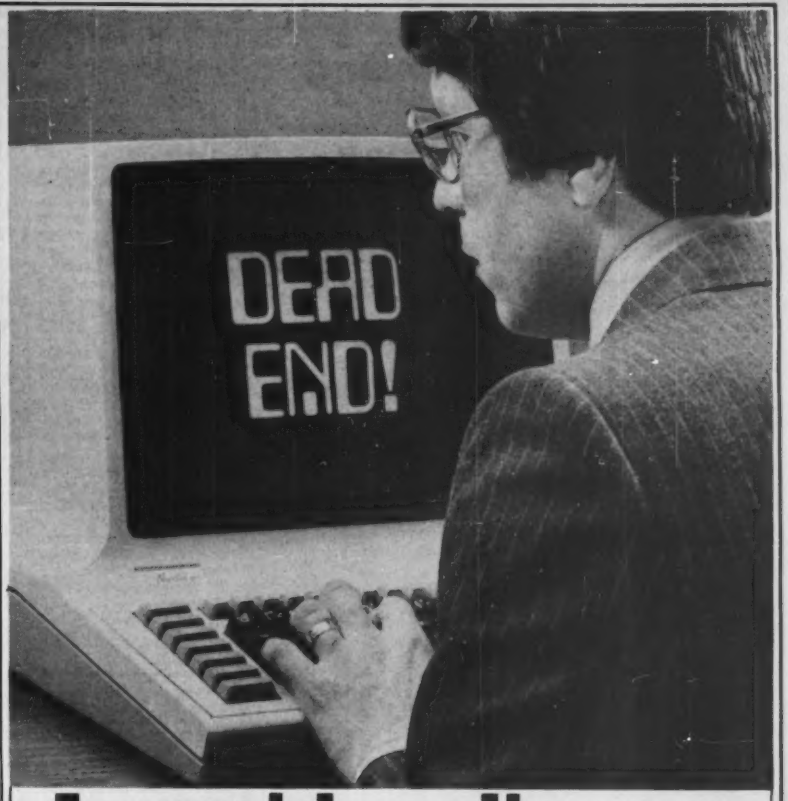

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data processing

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ACP Support

Minimum 4 years experience in ACP internals with a working knowledge of ACP tape routines, TPF and main supervisor. Starting salary approximately $2000/month.

SYSTEMS ANALYST/PROGRAMMER
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Minimum 4 years ACP file support experience with a working knowledge of capture/restore, exception recording, DYOPM, disk formatter, SYCON and PARS filing structures. Starting salary approximately $2000/month.

SR. SYSTEMS ANALYST/PROGRAMMERS
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Minimum 8 years experience in the ACP test tools area with a working knowledge of STC, STPP, RTT, OLPP, step-by-step trace and test by terminal address. Starting salary approximately $2300/month.

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Our Electronic Engineering department is seeking Senior Engineers with a BSEE/Computer Science degree and 3-8 years of applied technology and industry experience. Candidates are invited to contact our Professional Staffing group to set up immediate interviews with the Technical Staff for in-depth discussions on our projects which range from microprocessor control design to a broad spectrum of systems level engineering.

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Vocational - Technical Division
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Resumes and letters of application should be sent to:

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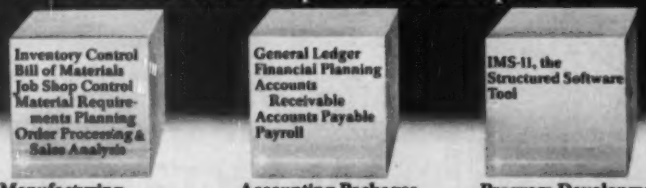

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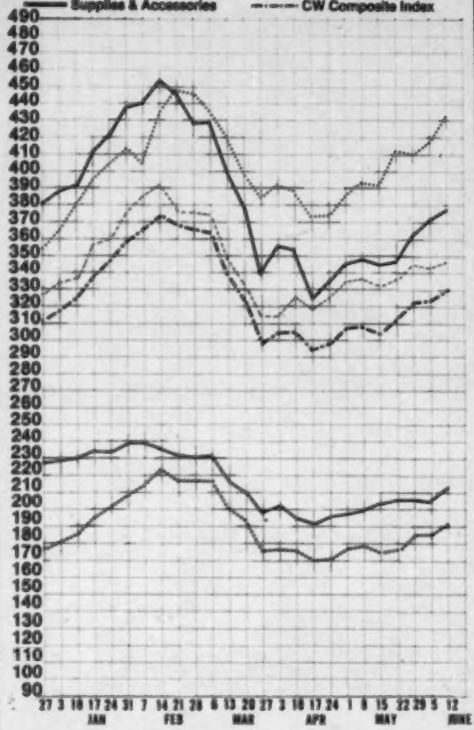

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 11, 1980

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

EXCH		1979-80 RANGE (1)	CLOSE JUN 11 1980	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	15- 42	19	- 5/8	-3.1
N	BURROUGHS CORP	60- 88	69	-2 7/8	-4.0
O	COMPUTER AUTOMATION	9- 22	16 3/4	+ 1/2	+3.0
N	CONTROL DATA CORP	35- 63	55 1/4	+ 3/4	+1.3
O	CRAY RESEARCH INC	30- 58	49 1/4	+1	+2.0
N	DATA GENERAL CORP	46- 75	64 1/4	+1 1/4	+1.9
N	DATAPOINT CORP	44- 56	55 3/8	+ 5/8	+1.1
N	DIGITAL EQUIPMENT	52- 83	69 1/2	+ 1/4	+0.3
A	EECO INC	9- 19	13 1/2	+ 3/4	+5.8
N	ELECTRONIC ASSOC.	6- 12	8 1/2	- 3/8	-4.2
N	FOUR-PHASE SYSTEMS	28- 49	22 3/8	-1 7/8	-7.7
N	FOXBORO	31- 44	37 1/2	- 3/4	-1.9
O	GENERAL AUTOMATION	7- 19	7 3/8	+ 1/4	+3.5
O	GRI COMPUTER CORP	1- 3	1 1/2	+ 1/8	+33.3
N	HEWLETT-PACKARD CO	46- 71	64 1/4	+ 3/4	+1.1
N	HONEYWELL INC	65-101	80 1/8	+2 1/2	+3.2
N	IBM	58- 79	58	- 1/8	-0.2
N	MANAGEMENT ASSIST	9- 21	12	- 3/4	-5.8
O	MANUFACTURING DATA S	22- 38	36	0	0.0
O	MINI-COMPUTER SYST	2- 6	3 1/8	+ 1/8	+4.1
O	MODULAR COMPUTER SYS	9- 17	14 3/4	+ 7/8	+6.3
N	NCR	52- 82	61 1/4	-1 1/8	-1.8
N	PRIME COMPUTER INC	15- 21	20 7/8	+ 7/8	+4.3
N	PERKIN-ELMER	26- 47	46 1/2	+1 3/4	+3.9
N	SPERRY RAND	42- 60	58 1/8	+ 7/8	+1.7
A	SYSTEMS ENG. LABS	11- 22	17 5/8	+ 5/8	+3.6
O	TANDEM COMPUTERS INC	26- 56	52 1/2	- 3/4	-1.4
N	TEXAS INSTRUMENTS	79-108	94 3/4	+2 1/8	+2.2
A	WANG LABS.	17- 40	34 5/8	+ 1/4	+0.7
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	13- 20	15 1/4	+ 1/4	+1.6
N	COMDISCO INC	6- 17	11 1/4	+ 5/8	+5.8
A	COMMERCE GROUP CORP	1- 2	1 1/8	0	0.0
A	COMPUTER INVSTRS GRP	2- 4	2 1/8	+ 1/8	+6.2
O	CONTINENTAL INFO SYS	2- 15	2	+ 1/2	+33.3
N	DATRONIC RENTAL	2- 3	2 1/2	0	0.0
A	DCL INC	4- 6	5 3/8	0	0.0
N	DPF INC	5- 12	6 1/2	+ 3/8	+6.1
N	ITEL	1- 15	2 7/8	- 3/8	-11.5
O	LEASPAC CORP	1- 2	1 1/8	0	0.0
A	PIONEER TEX CORP	2- 4	2 3/4	+ 1/8	+4.7
N	RELIANCE GROUP INC	24- 73	65	-1 3/8	-2.0
N	U.S. LEASING	12- 18	14 1/2	- 5/8	-4.1

EXCH		1979-80 RANGE (1)	CLOSE JUN 11 1980	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 3	2	- 3/8	-15.7
O	ANACOMP INC	7- 15	12 1/2	- 1/4	-1.9
O	ANALYSTS INTL CORP	3- 6	4 1/4	0	0.0
A	APPLIED DATA RES.	6- 14	10	+ 1/8	+1.2
N	AUTOMATIC DATA PROC	31- 41	38 5/8	- 1/4	-0.6
O	COMPUTER HORIZONS	1- 9	3 3/4	0	0.0
O	COMPUTER NETWORK	4- 9	4 1/8	- 1/4	-5.7
N	COMPUTER SCIENCES	11- 24	21 3/4	+1 7/8	+9.4
O	COMPUTER TASK GROUP	1- 9	8	+ 3/4	+10.3
O	COMPUTER USAGE	2- 8	2 3/4	0	0.0
O	COMPUT AUTO MEP SVC	4- 10	4 3/4	+ 1/4	+5.5
O	COMSHARE	11- 29	15	+1 1/2	+11.1
O	CULLINANE CORP	10- 37	36	+2 1/2	+7.4
O	DATA DIMENSIONS INC	1- 6	1 1/8	+ 1/8	+12.5
O	DATATAB	1- 4	1	- 1/4	-20.0
O	DSI CORP	4- 9	6 3/8	+ 1/8	+2.0
N	ELECTRONIC DATA SYST	19- 29	23 1/4	+ 3/4	+3.1
O	INFORMATICS INC	9- 22	16 1/2	+1 3/4	+11.8
O	INSYTE CORP	1- 3	1 7/8	+ 1/4	+15.3
O	IPS COMPUTER MARKET.	2- 4	3	0	0.0
O	KEANE ASSOCIATES	3- 9	5 1/2	0	0.0
O	KEYDATA CORP	2- 5	2 1/8	- 1/8	-5.5
A	LOGICON	12- 23	20	+2	+11.1
O	MATHEMATICA INC	5- 13	9	0	0.0
O	NATIONAL DATA CORP	10- 20	17 1/2	- 1/2	-2.7
N	PLANNING RESEARCH	5- 9	5 5/8	- 1/8	-2.1
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	4- 7	4 1/2	- 1/8	-2.7
O	REYNOLDS & REYNOLD	24- 34	28	+1 1/4	+4.6
O	STSC INC	6- 11	9 1/2	+1	+11.7
O	SCIENTIFIC COMPUTERS	8- 17	12	+ 1/4	+1.9
N	TYMSHARE INC	34- 58	47 7/8	- 1/8	-0.2
A	URS SYSTEMS	5- 12	11	0	0.0
N	WYLY CORP	4- 9	7 1/2	- 1/8	-1.6
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	13- 28	16 5/8	- 7/8	-5.0
N	AMPEX CORP	14- 29	28	- 1/8	-0.6
A	ANDERSON JACOBSON	9- 17	11	- 5/8	-5.3
N	APPLIED DIG DATA SYS	5- 10	6 3/8	- 1/4	-3.7
O	AUTO-TROL TECHNOLOGY	18- 49	34 1/4	+2 1/2	+7.8
O	BEEHIVE INT'L	3- 8	6 3/8	+ 1/8	+2.0
A	BOLT,BERANEK & NEW	12- 22	19	+1 3/4	+10.1
N	BUNKER-RAMO	17- 32	28 5/8	- 1/2	-1.7
O	CAMBRIDGE MEMORIES	1- 9	1 5/8	- 1/8	-7.1
N	CENTRONICS DATA COMP	20- 55	34 1/2	-2 5/8	-7.0
A	CETEC CORP	3- 7	5 1/2	- 1/8	-2.2
O	COMPUTER DEVICES INC	5- 9	7 1/4	+ 3/8	+5.4
O	COGNITRONICS	1- 4	2 5/8	+ 1/8	+5.0
O	COMPUTER COMMUN.	4- 18	3 5/8	- 1/8	-3.3
O	COMPUTER CONSOLES	4- 29	13	+ 1/2	+4.0
O	COMPUTER TRANSCEIVER	1- 5	2 1/2	+ 1/8	+5.2
N	COMPUTERVISION CORP	24- 99	55 3/8	+1 1/8	+2.0
N	CONRAC CORP	13- 25	19 1/4	+1 1/8	+6.2

EXCH		1979-80 RANGE (1)	CLOSE JUN 11 1980	WEEK NET CHNGE	WEEK PCT CHNGE
A	DATA ACCESS SYSTEMS	6- 14	11 1/4	+ 3/4	+7.1
A	DATA PRODUCTS CORP	11- 24	16	+1 3/8	+9.4
O	DATUM INC	2- 4	2 1/8	0	0.0
O	DECISION DATA COMPUT	2- 5	2 1/2	+ 1/4	+11.1
O	DELTA DATA SYSTEMS	1- 3	1	0	0.0
N	DOCUMATION INC	7- 27	7 7/8	- 1/8	-1.5
O	DATARAM CORP	6- 37	9 1/2	0	0.0
N	ELECTRONIC M & M	3- 6	4 1/8	+ 1/8	+3.1
O	EVANS & SUTHERLAND	21- 32	31	+1	+3.3
O	FABRI-TEK	1- 2	2 5/8	+1 1/8	+75.0
O	GENERAL COMPUTER SYS	1- 3	2 1/4	0	0.0
O	GENERAL DATACOMM IND	12- 18	16	+2 1/2	+18.5
O	GENERAL TERMINAL CP	1- 4	2 1/4	+ 1/4	+12.5
N	HAZELTINE CORP	12- 30	23 5/8	- 5/8	-2.5
N	HARRIS CORP	25- 40	35 1/2	+1 3/4	+5.1
O	INFOREX INC	1- 8	1	- 5/8	-38.4
O	INFORMATION INTL INC	8- 15	10	+ 1/4	+2.5
O	INTEL CORP	45- 75	68	+ 1/2	+0.7
O	INTERSIL	13- 33	21	+ 7/8	+4.3
A	LUNDY ELECTRONICS	4- 12	8 3/8	+ 1/8	+1.5
O	MSI DATA CORP	5- 11	6	- 3/8	-5.8
N	MEMOREX	10- 34	14 1/4	+1 1/8	+8.5
N	MOHAWK DATA SCI	10- 20	16	+ 5/8	+4.0
O	OMEX	2- 10	7 1/2	0	0.0
A	PARADYNE CORP	18- 28	27 5/8	+ 7/8	+3.2
A	PENRIL CORP	9- 15	9 7/8	+ 1/4	+2.5
O	RANTEK CORP	10- 17	12 3/4	- 1/4	-1.9
O	RECOGNITION EQUIP	9- 13	8 1/8	- 1/8	-1.5
O	SCAN DATA	1- 5	1 1/8	0	0.0
N	STORAGE TECHNOLOGY	12- 21	14 1/2	- 3/8	-2.5
O	SYKES DATATRONICS	14- 27	25	0	0.0
O	T BAR INC	14- 28	19 1/4	+ 3/4	+4.0
A	TEC INC	3- 9	4 5/8	+ 7/8	+23.3
N	TEKTRONIX INC	42- 64	49 3/4	+2	+4.1
N	TELEX	3- 6	3 1/2	0	0.0
O	TESDATA SYSTEMS CP	8- 26	9	+ 1/4	+2.8
O	TIMEPLEX INC	7- 14	12 1/4	+ 3/8	+3.1
O	WILTEK INC	1- 2	1 7/8	0	0.0
	SUPPLIES & ACCESSORIES				
A	AMERICAN BUS PRODS	8- 13	10 1/2	+ 1/2	+5.0
O	BALTIMORE BUS FORMS	1- 2	3/4	- 1/4	-25.0
N	BARRY WRIGHT	15- 28	25 5/8	+ 7/8	+3.5
O	CYBERNETICS INC	1- 1	3/4	0	0.0
A	DUPLEX PRODUCTS INC	11- 13	11 3/4	0	0.0
N	ENNIS BUS. FORMS	13- 21	17 1/8	- 1/4	-1.4
N	3M COMPANY	46- 58	55 1/4	+ 5/8	+1.1
O	MOORE CORP LTD	27- 34	32	+1	+3.2
N	NASHUA CORP	20- 35	23 3/8	- 1/4	-1.0
O	STANDARD REGISTER	22- 29	28 1/4	+1 3/4	+6.6
A	TAB PRODUCTS CO	13- 23	18 1/2	-1 1/4	-7.8
N	WABASH MAGNETICS	11- 18	12 3/8	+ 3/8	+3.1
N	WALLACE BUS FORMS	23- 32	30	+1 3/4	+6.1

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